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THE HAUSA TERRITORIES.*

I. HAUSALAND.

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Before beginning to describe the country which I have recently had the pleasure of visiting, I ought perhaps to say something in regard to the use of the expression "Central Sudan." The word "Sudan," which means simply the black country, *i.e.* the country of the blacks, is applied by the natives themselves to the whole of the vast region, south of the Great Sahara and north of the equator, stretching from the river Nile on the east to the Atlantic Ocean on the west. To the Hausa States, which occupy about the middle of this immense area, may be most correctly referred the title Central Sudan. The Hausa States extend, roughly speaking, from lat. 8° to 14° N., and from long. 4° to 11° E. They include an area of about half a million square miles. The reason why this region, the most populous and fertile region in all Central Africa, has been so long, comparatively speaking, neglected is that it is shut off from intercourse with the sea, and thus with Europeans, by two obstacles of more than ordinary magnitude. Of the two possible ways by which this territory can be approached, the shortest and most obvious is to ascend the Niger for about 300 miles, and thence proceed overland; the distance to Kano, the most important town in the Hausa States, being about 400 miles from the river. The great drawback to this route is the extreme unhealthiness of the Niger delta, and the difficulty of obtaining any satisfactory transport through it. Moreover,

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† Author of 'Hausaland; or, Fifteen Hundred Miles through the Central Soudan.' Sampson Low. Illustrated. 14s.

it is only within the lifetime of men still living that this route has been rendered possible at all, by the discovery of the mouth of the Niger. As late as 1788, barely more than a century ago, the African Association, which was afterwards incorporated with the Royal Geographical Society, sent out Ledyard as their representative, with instructions to go *viâ* Cairo to search for the mouth of the Niger, thus clearly showing that they believed the Niger and the Nile to be the same river.

The other possible way in which Hausaland may be reached from the sea is by crossing the Great Sahara from the Mediterranean, the distance to Kano by this route being about 1800 miles, a considerable portion of which is across an almost waterless desert. After spending nearly a year in Tripoli and in Tunis, studying the Hausa language and making inquiries as to the possibility of crossing the desert from the north, I came to the conclusion that this route is for the present impracticable, and accordingly decided to go by way of the river Niger. Accompanied by two other Englishmen, Dr. Tonkin and Mr. Bonner, I ascended the Niger for 300 miles as far as Lokoja, and thence ascended the Binué for 100 miles to Loko. Leaving the river here, we walked on foot for 350 miles to Kano, the direction being almost due north. The greater part of the country between Loko and Kano is forest, but it is so thinly wooded that it is usually possible to see from 50 to 100 yards on either side of the path. We took observations day by day with aneroids and boiling-point thermometer, in order to ascertain the altitudes, and a few observations for longitude. Loko itself, though 400 miles up from the sea, is only 425 feet above sea-level. A hundred miles north of Loko, Kaffi, a town of about 15,000 or 20,000 inhabitants, has an altitude of 1000 feet. On leaving Kaffi the ground begins rapidly to rise, till about 100 miles further north it attains an altitude, at a place called Katill, of 2530 feet above sea-level. This is the highest point we passed anywhere in the course of our journey, and, with the exception of a few isolated points, is the highest district in the whole of the Hausa States. North of Katill the ground gradually declines, Zaria, 50 miles north of Katill, and 250 north of Loko, being just over 2000 feet. From Zaria to Kano the country continues to decline, the level of Kano being 1690 feet. This last represents the elevation of a very large district for many miles around Kano. The question of elevation in the Central Sudan is one of considerable interest, as the comparative healthiness of different districts bears a close relation to their respective elevations. We shall refer to this again a little later on.

In maps of Africa which are drawn so as to illustrate the comparative density of the population in different districts, the Hausa States are usually marked so as to suggest that the population is denser here than in any other part of the continent, or, at any rate, of tropical Africa. The Hausa-speaking population has been estimated by travellers at

about 15,000,000, and though such an estimate must necessarily be extremely rough, we saw no reason for suggesting any great change by way either of addition or subtraction. Every day, as a rule, we passed two or more villages of considerable size, and about every 50 miles we came across a town containing from 10,000 to 30,000 inhabitants. The political capital of the whole country is Sokoto, situated in the north-western corner of Hausaland, a large portion of the inhabitants of which are not Hausas, but Fulahs. The commercial capital, and by far the most important town, is Kano. The market of Kano is, indeed, the most important in the whole of tropical Africa, and its manufactures are to be met with from the Gulf of Guinea on the south to the Mediterranean on the north, and from the Atlantic on the west to the Nile or even the Red Sea on the east. Any one who will take the trouble to ask for it will find no difficulty in purchasing Kano-made cloth at towns on the coast as widely separated from one another as Alexandria, Tripoli, Tunis, and Lagos. The market-place of Kano is probably the largest in the world. Colonel Monteil, who visited it four years ago, estimated the average daily attendance at the market to be from 25,000 to 30,000, and the estimate does not appear to be much, if at all, above the mark. It is the great meeting-place for traders from almost all parts of Africa north of the equator and west of the Nile valley. The Tuarek of the desert comes in touch here with the natives of Adamawa and the south; the Arab merchant meets here with traders from Lake Chad on the one side, and the Niger, or even the Atlantic seaboard, on the other. Here too are to be seen Mussulman pilgrims from far and near, on their way to or from Mekka. The walls of the town, which are kept in very fair repair, are 15 miles in circumference, and are entered by thirteen gates. The principal occupation of its inhabitants consists of the weaving of cloth from native-grown cotton, and in manufacturing it into garments of various kinds. As Monteil says, Kano clothes far more than half the population of the Central Sudan. The greater part of this cloth is dyed blue, the native indigo, which grows wild all over the country, being used for this purpose.

The most important article of commerce in the Kano market, on the supply of which the prosperity of the town to a large degree depends, is the kola nut, *Sterculia acuminata*. Though it does not grow in any part of the Hausa States, there is, nevertheless, no village or hamlet, however remote, in which it is not constantly used. The district from which it is imported lies at the back of the Gold Coast colony. It is of a brick-red colour, and about the size of a large chestnut, and its taste is peculiarly bitter. The natives believe that it keeps off the pangs of hunger, and enables them to work for long periods without food. I have frequently known our carriers start in the morning without any breakfast, and do a whole day's work with perhaps one or two kola nuts to chew as they went along. The fact that for generations past it has

been eagerly sought after by rich and poor alike, and that they will constantly spend the last cowries they possess in buying one to chew, seems clearly to show that it is something more than a mere luxury. As a stimulant it takes the place which tea and coffee occupy with us, neither these nor any other stimulant being here used.

The Hausa native is perfectly black, but he does not possess such thick lips or such curly hair as we are accustomed to associate with the ordinary negro. He is naturally a trader rather than a soldier, but when trained, as he has frequently been down on the coast, by English officers, he is more than a match for any other native. The Governor of the Gold Coast told me that in a battle the Hausas appeared utterly devoid of fear, and that the only difficulty was to restrain them. It would not infrequently happen that a small body of Hausas, having defeated the enemy to whom they were opposed, would pursue them to a considerable distance from the scene of battle, and perhaps stop to raid their village before returning to look after or assist their companions. It is hard for any one who has not actually seen Hausa porters to believe the weights which they are accustomed to carry. While staying at Lokoja, the officer in command of the Royal Niger Company's Hausa troops pointed out to me a mountain gun lying on the ground, and asked me if I could lift it. With considerable difficulty I succeeded in raising it about an inch off the ground. He then told me that one of their Hausa soldiers was regularly accustomed to carry this gun on his head. On my appearing somewhat incredulous, he had the man sent for, and told him to put the gun upon his head, which he proceeded to do, and walked for some little distance with it. The officer told me that on one occasion he had been known to carry this gun 22 miles in the day. During the course of our expedition we employed as carriers Nupes, Yorubas, and Hausas, and our experience was that the average Hausa would carry exactly double what any other native would carry. If you ask a Hausa why his people are so strong, he will tell you that it is because of the different food which he eats. The tribes in the Niger delta and near the sea-coast live for the most part on yams and bananas, which are produced with the minimum amount of labour. The Hausas live almost entirely on guinea-corn. Guinea-corn is a species of millet, and has a very minute and hard red grain. This is ground up by the natives, and, mixed with water, makes a sort of porridge, which has, however, a most disagreeable, sour taste. In Kano several other grains are procurable, including wheat. Bread is on sale during part of the year, but so much red pepper is used in its manufacture that it is scarcely possible for a European to eat it. On only one occasion were we reduced to any serious straits through lack of food. Having met with an unfavourable reception from a king who bore the high-sounding title of "King of the Sudan," who had refused to allow us to buy any food in his market, we were compelled

to march for four days, a distance, *i.e.*, of about 60 miles, through a district which this king had recently raided for slaves, and the food supply of which he had destroyed. The march through his territory occupied about four days, and it was with feelings of no ordinary relief that we emerged from the sphere of influence of this particular king.

There are two regular caravan-routes between Kano and the shores of the Mediterranean, by which a large amount of European goods are annually brought across the desert. I had fully intended returning by one or other of these routes. The most direct of the two leads directly north from Kano *viâ* Zindar, Asben, and Ghat. On making inquiries at Kano as to this route, we were informed that the Tuareks, through whose territory it would be necessary to pass, were so hostile to Europeans that it would be quite impossible for any one other than a native to go this way. Several Arabs, we were told, had been recently murdered by them because, owing to their light complexion, the Tuareks believed them to be Christians in disguise, and this notwithstanding their protestations of being orthodox Mohammedans. Finding this route closed, we turned our attention to the other *viâ* Lake Chad, Bilma, and Murzuk. This route, unfortunately, proved to be even more impracticable than the other, owing to the civil war which was then raging in Bornu, and which had put an end to all native trade for some time past. Rabba, an ex-slave of Zubehr Pasha, and a former lieutenant of the Mahdi, had overrun the whole province of Bornu, and had destroyed its capital, Kuka, a town of 60,000 inhabitants. It would have been impossible to find a single carrier willing to have attempted the journey to Lake Chad, and to travel without carriers or servants was of course impossible. Whilst still debating as to what we should do, my three companions, *i.e.* the two Europeans and the Tunisian Arab whom I had taken out with me, all became so extremely ill that it was obvious that if they were to reach the coast, which was nearly 800 miles distant, alive, it would be necessary to start without any great delay. The route which we followed on our return journey lay further to the west than the one we had taken on entering the country, and brought us down eventually to the middle Niger at a point a little above Egga, which is about 400 miles from the sea.

In looking forward to the future development of this country, there are three points which seem to claim special attention. I would name them in the order in which they will in all probability be attained: (1) the provision of a better currency; (2) the improvement of transport; and (3) the abolition of slave-raiding. Throughout the greater part of Hausaland, the only currency which is everywhere recognized consists of cowrie shells. When we remember that 2000 cowries on an average are only equal in value to 1*s.*, and that the equivalent of 10*s.* weighs something like 100 lbs., we can easily understand how great an obstacle to trade and enterprise the use of such a currency must necessarily be.

The only advantage that the native apparently derives from it is the unlimited opportunities which it affords him for cheating the white man, who has neither time nor patience to count his own money. Soon after our arrival in Kano, a present was brought to us from the king, part of which consisted of 100,000 cowries, *i.e.* about £3. The cowries were brought in baskets supposed to contain 20,000 each. It so happened that I owed the man who was responsible for bringing them 10,000 cowries. Noticing that one of the baskets which he had brought was very much underweight, some 2000 cowries having been abstracted from it, I asked the man if he were certain that this particular basket contained its proper amount. On receiving his indignant assurance that this was so, I told him to sit down and count from this basket the 10,000 cowries which I owed him. He did so with great alacrity, thinking, no doubt, that the white man was sadly lacking in sagacity to allow a creditor to count his own money. I noticed that he took full advantage of his privilege, and, so far as I could judge, the sum which he counted exceeded by at least 2000 that to which he was entitled. His work finished, I asked him again if he was quite sure that the basket as delivered by him had originally contained 20,000. On his replying in the affirmative, I suggested to him that, this being so, the amount which remained over, now that he had counted out his own 10,000, must therefore be 10,000. On his assuring me that my calculation was correct, I told him to leave me the 10,000 which he had just counted, and to take the other 10,000 as his due. He departed with a look of chagrin on his face which it was piteous to see, but doubtless with his opinion as to the white man's sagacity very considerably improved. The only coin which passes at all in the interior is the Maria Therésa dollar which was coined in Austria in 1780. I took with me a considerable number of these coins, which through the kindness of the Royal Niger Company, I was able to procure from Vienna, and I found that in all important towns there was no difficulty in passing them. The continued importation of this dollar would, I believe, appreciably tend to develop the native trade of the interior.

The second point which claims special attention, in view of the development of this country, is the improvement of transport. At the present time, except during the dry season in limited areas, everything has to be carried on men's heads—a method of carriage, as has so often been pointed out, than which nothing could be worse. If the resources of this country are ever to be developed—resources which are probably greater than those of any other part of tropical Africa—it can only be by means of a railway. The remarkable progress which has recently been made in the building of railways both in South and in East Africa may well encourage the hope that the time will soon come when we shall see the far interior of West Africa connected with the coast, or at least with the river, in the same way.

The third, and by far the most important point to be considered in reference to the development of this country, is the suppression of the slave-trade and of slave-raiding. If it be true that the Hausa-speaking population of the interior numbers fifteen million, it is certainly the case that the Hausa slave population numbers at least five million, or, to put it in another way, that one out of every three hundred people now living in the world is a Hausa-speaking slave. Slave-raiding and the traffic in slaves, to which it ministers, is the great overshadowing evil of the Central Sudan. There is no tract of equal size in Africa, or indeed in the world, where the slave trade at the present moment is flourishing to so great an extent or so entirely unchecked by any European influence. Moreover, we cannot allow ourselves to forget that the whole of this country, where this slave-raiding is being carried on, has now been recognized, thanks to the action of the Royal Niger Company, as within the British sphere of influence, and that the responsibility of allowing this state of things to continue rests upon England, and upon England alone. By claiming for ourselves this vast tract of country, we have claimed one of the most important and most valuable sections of equatorial Africa, but we have at the same time claimed for ourselves a great and pressing responsibility. The great majority of the slaves in Hausaland are obtained not from foreign or outside sources, but from villages or towns, the inhabitants of which are of the same tribe and race as their captors. The practical result of this is that the country is subject to nearly all the evils of a perpetual civil war. There is no real security for life or property anywhere. At any moment the king in whose territory any town or village lies, may receive a message from the king to whom he is himself tributary, ordering him to send at once a given number of slaves on pain of having his own town raided. He thereupon selects some place within his own territory, and, without perhaps the shadow of an excuse, proceeds to attack it and to carry off its inhabitants as slaves. The attack is usually made in overwhelming numbers, so as to prevent any serious resistance. Any who attempt to resist are massacred on the spot; the rest are made to march in fetters to the town of their captors, whence they are either passed on to some central slave-market, or kept for awhile in order to be included in the annual tribute payable to the Sultan of Sokoto.

During the course of our march from Loko to Egga *viâ* Kano, a distance of about 800 miles, we had frequent opportunities of seeing something of the evil caused by slave-raiding, and of the insecurity to life and property to which it gives rise. Soon after leaving Loko we entered the town of Nassarawa, where we were compelled to wait till the return of the king from a slave-raid, on which he was then absent. On reaching a village a few miles further on, which bore the euphonious name of Jimbambororo, we were told that its king was not feeling sweet

owing to the fact that twenty of his subjects had that very morning been seized as slaves by the people of an adjacent town. On leaving this village we passed a spot where, two days before, fifteen native merchants had been carried off as slaves; and, again, shortly before reaching the town of Kachia, we were shown another point on our path where, within the two previous days, a similar fate had befallen five other travellers. On arriving at the town of Zaria, in the market-place of which we saw about two hundred slaves exposed for sale, we were once again informed that the king was absent on a slave-raiding expedition. During our stay in Kano, in the market-place of which five hundred slaves are always on sale, one thousand were brought in on a single occasion as the result of such an expedition. In the course of our march from Kano to Bida we passed towns and villages, literally without number, which had been recently destroyed and their inhabitants sold as slaves; and this not by any foreign invader, but by the king in whose territory the places themselves were situated.

Slaves are used in the country for two distinct purposes; first, as currency where any large amount is involved, and secondly, as carriers. No solution of the problem will be permanently satisfactory which does not take account of, and endeavour to supply in some more convenient way, these two needs. Of the tribute payable by all the Hausa States to Sokoto, at least three-quarters is paid in slaves, the total annual number being many thousands, probably even tens of thousands. All that has been done up to the present to check slave-raiding has been done by the Royal Niger Company without any direct assistance from the British Government. By means of one or two small armed launches they have endeavoured to prevent slave-raiders from crossing the rivers Niger and Binue; but even were they to succeed completely in effecting this object, it would but be touching the fringe of the difficulty. A chartered company, however philanthropic a body its directors may be, cannot, without considerable assistance from the Government, attempt to cope with so stupendous an evil. What is wanted in the first instance is to enlighten the public generally as to the existence of the evil, and so to prepare the way for some action to be taken with a view to its suppression.

I should like to say a few words, before concluding, in regard to the Hausa language, the study of which was one of the principal objects of our expedition. The language has special claims to attention from the fact that it is possibly the most spoken language on the continent of Africa. Its only rivals, from the point of view of numbers speaking the language, are Swahili and Arabic; but though either of these might claim to be understood over an almost equal area, neither of them is probably spoken by anything like fifteen million people, the number, that is, who are believed to speak Hausa within Hausaland itself. Looking forward, moreover, into the not very distant future,

four languages, and four only, will dominate the whole of the continent, and these are English, Arabic, Swahili, and Hausa. English will be the language of the south, Arabic will be the language of the north, while Swahili and Hausa will be the languages of eastern and western tropical Africa. In regard to the connection existing between Hausa and other languages, in so far as it is possible to form any opinion after only three years' study, it seems to me to be probably connected, not directly with Arabic or any Semitic language, but rather with the group of languages to which Berber and Coptic probably belong. It has been suggested that this at present ill-defined group represents an earlier stream of immigration into Africa than the Semitic, and that the resemblance between the grammatical structure of the two points to that prehistoric time when both races, or groups of races, inhabited a common Asiatic home. Should this theory ever be established, the interest from the philologist's point of view attaching to the study of what may, perhaps, prove to be the most important representative of this group, can scarcely be over-estimated. Hausa has been reduced to writing for at least a century, and possibly very much longer. According to the history now existing in writing, Kano has been occupied as a Hausa town for about 950 years. Prior to this the Hausas were collected near a town called Daura, a little to the north of Kano. On my inquiring from the most learned man I could find in Kano, as to what traditions the Hausas possessed in regard to their original home, he replied that in very early time, prior to their settlement at Daura, they had come from the very far east away beyond Mekka. It is hard to say what importance is to be attached to this tradition, the existence of which is specially significant in view of the possibility of the language having been Semitic, or allied to the Semitic, in its origin.

For those who are interested in the study of the Hausa language, I may add that within the next three months the Cambridge University Press will publish a volume consisting of the Hausa manuscripts which we brought back with us, reproduced in facsimile, with translation, transliteration, and notes added. It is hoped that an appeal for support which the Hausa Association is at present making, with a view to establishing at Tripoli a permanent centre for the study of the Hausa language and the training of Hausa natives, may enable further work of a similar kind to be attempted.

I have refrained from enumerating the natural products of Hausaland, which in the near future should make the country of so great importance from a commercial standpoint, as they will naturally be referred to in the paper which is to follow. I should like, however, to add a few words in regard to the future of this vast district, which, thanks to the action of the Royal Niger Company, has been secured for British influence. There are some, perhaps, to whom the extreme

unhealthiness of the West Coast would naturally suggest the reply that the advantage to be gained by the opening up of these regions can never be proportionate to the loss of life which it must necessarily involve. They would, in fact, be disposed to apply to these districts the Irishman's description of his own land, "It is a magnificent country to live out of." But there are others, and they are by no means few in number, who see in the opening up of fresh fields of trade and enterprise the best solution of social difficulties at home; to whom, moreover, the cry for help from unnumbered millions of slaves appeals with irresistible force, and who believe that to the Anglo-Saxon race has been committed a unique opportunity for civilizing and, it may be, for Christianizing the natives of Africa. To such the difficulties or dangers above alluded to will appear of but small account compared with the magnificence of the task which it is their privilege to undertake. At the Congress which met here in July last, the question was discussed at some length as to what extent tropical Africa was capable of being colonized by Europeans. The two conditions, as to which there was a general concensus of opinion, were, first, that the climate, as expressed chiefly by the diurnal and yearly range of temperature and the moisture present in the air, must approximate to those of countries already settled by Europe, and, secondly, aggravated malaria must be absent. To attain these conditions, it was stated that the elevation of the proposed colony must not be less than 5000 feet. Even if we place the limit 1000 feet lower than that suggested, it would still be the case that no part of the Hausa States, or of the whole of the Central Sudan, fulfils this necessary condition. When, moreover, we add to this that aggravated malaria is found with more or less frequency throughout the whole of this area, we are forced to accept the conclusion that the colonization of Hausaland by Englishmen is and must ever remain impossible. By colonization is, of course, meant the establishment of permanent homes and the rearing of families as opposed to more or less prolonged visits to the country followed by an ultimate return to Europe. In this the strict sense of the word, no part of Hausaland will ever be colonized from Europe. Fortunately, our empire, with its never-setting sun, provides us with no lack of colonies in which the above conditions are amply fulfilled. But if Hausaland cannot be colonized by Englishmen, it can none the less be governed and exploited by them to the mutual advantage of the governors and the governed. Two things will have to be done before we can confer any permanent benefits upon the natives, or obtain any definite advantage for ourselves. Slave-raiding must be stopped, and trade communications must be improved. The two go together, and it will be impossible fully to secure the one without the assistance afforded by the other.

A few years ago it would have seemed vain to discuss the possibility of suppressing the slave-trade in the very heart of Africa, and yet more

so to discuss the question of making a railway to a place 800 miles from the coast, in a climate almost as bad as could be conceived, but what would have seemed utterly impossible a few years ago is now well within the range of practical politics. The extraordinary interest which has been aroused in the Dark Continent within the last few years, and the great sacrifices which have been made and are now being made in order to secure the opening up of the eastern and southern portions of Central Africa, may well encourage us to hope that the day is not far distant when what has been done elsewhere will be done here, and the inestimable benefits of freedom and of good government may be conferred, even if they have to be forcibly conferred, upon this great country and people.

II. NOTES ON A JOURNEY THROUGH THE SOKOTO EMPIRE AND BORGU IN 1894.

By WILLIAM WALLACE.

It is not an easy matter to give in a half-hour paper any satisfactory description of an African journey extending over 2000 miles. Fortunately, before commencing these brief notes on my mission through the Fulah empire in 1894, I was told that a paper would be previously read by the student of the Hausa Association on his journey from the mouth of the Niger to Kano, and his residence there. I propose, therefore, to commence my notes at my departure from the town of Kano, and give such brief description as the time allotted to me permits of my journey thence to Wurnu, Gandu, and Boussa. I will remark, however, that while we were at Kano civil war held the entire province in its grasp. Every few days batches of prisoners were butchered in the market-place with the customary indignities to the dead, parts of the bodies being utilized as medicines and for poisoning arrows, and the remains left to the dogs and vultures. Numbers of women were strangled simply because they belonged to the rebel party without the town. All this, combined with the simultaneous destruction of Kuka, the capital of the neighbouring kingdom of Bornu, by Rabba—better known in Europe as Rabba Zubehr—caused an almost entire cessation of the movement of Hausa caravans both from the east and north. As I shall have frequent occasion to mention the *wuziri* or grand vizier of the Sokoto empire, I must also devote a few words to this important personage, who had been sent at that time to Kano by the Sultan of Sokoto to try and quell the civil war. It would have been useless, for the purposes of my mission, to proceed to Wurnu, the capital of the Sokoto empire, while the grand vizier was absent; so we arranged to travel thither together when his business in Kano was completed. The wuziri is a fine type of the ruling Fulah race. He is nearly

seventy, tall, vigorous, and highly intelligent. Owing to the seclusion in which the Sultan of Sokoto lives—somewhat similar to that of the Mikado of Japan in former days—the grand vizier practically rules the whole Fulah empire. When first I saw him, he was seated on a mat placed on the mud floor of the small house he occupied in Kano, quietly studying, through a pair of large horn-rimmed spectacles, an Arabic manuscript. It struck me as a curious contrast to see him sitting in the darkened house, without kingly garments or the least sign of state, while within a few hundred yards the emir of the province of Kano was seated in embroidered robes on a gaudy throne, and was surrounded by a courtly retinue dressed in all the tawdry imitation of Eastern courts. The wuziri's business in Kano occupying more time than he had expected, I decided, after a month's residence there, to move towards Wurnu, making stays at a few important places to acquire further information about the country, and thus enable him to overtake me. On May 7, 1894, I had said good-bye to Mr. Zweifel, who, accompanied by Mr. Widdicombe, had led a second expedition from the river Benue to Kano, and was then returning *viâ* Nupe to the Middle Niger. As Mr. Zweifel died last September, apparently unnoticed by the geographical world, I should like, in passing, to pay a tribute to his fifteen years' admirable work as an explorer. In 1880 he had discovered the sources of the Niger as the leader of an expedition which started from Sierra Leone. In 1884 he joined the Royal Niger Company, and for over ten years did valuable work as an explorer and cartographer. Mr. Zweifel was a native of Glarus, in Switzerland, and his untimely death was a great loss both to the company and to geographical knowledge.

On May 20, 1894, I left Kano, accompanied by Mr. Teed, and in three days reached Rogo, a frontier town in the province of Kano, some 60 miles to the west. Here we remained ten days, collecting information of every kind; and then travelled to Fawa, in the province of Katsena, about 70 miles from Rogo. The following description of the country traversed may be taken as applying generally to those portions of Hausaland which are not constantly devastated by marauders—a very wide exception.

Most of the land is under cultivation, with the exception of perhaps a fourth lying fallow in its turn. Much of the ground in the neighbourhood of the towns is divided into fields by raised earthwork dykes or hedges, mostly of cactus. Great numbers of the economic trees are left standing in the fields. Amongst these are the shea-butter tree, from which a good fruit is obtained, as well as a large quantity of vegetable butter. The latter is used for cooking as well as for lighting purposes, and many other uses. This tree is probably the most valuable tree in Hausaland, or, I may say, throughout the Sokoto empire. Next in importance comes the locust tree, from which a large quantity of food

is obtained. At the time of our journey thousands of the inhabitants were practically living on this diet, the locusts having devoured much of the green crops the previous year, thus creating a famine in the land. To avoid a repetition of this disaster, the natives had begun to grow large quantities of cassava, which the locusts will not touch. The next tree in importance is the gambier, the fruit of which is used for tanning hides. The tamarind tree is also frequently seen; its fruit is greatly praised. There are numerous plum-trees growing both in towns and in the fields, and, as in other parts of tropical Africa, the valuable kuka tree is left standing, for it yields both fruit and a capital fibre, while its leaves are used for making a nutritious soup. In the trees close to the hamlets great quantities of bees are reared, which produce excellent honey. Wild honey is also found in quantity. Quantities of silk-worms feed on the tamarind trees. Their silk is in great request when spun and dyed red or green. It is used for embroidering the native gowns, in decorating which a tailor will spend weeks. Fancy patterns for the women are also woven from this silk. The chrysalis is highly valued as a specific for ear-ache. It is first roasted and then ground into powder, which, when required for use, is mixed with water and dropped into the ear. In addition to the above trees, there are numerous and extensive forests of gum trees and other economic trees, valuable from the commercial standpoint.

As one passes through the fertile country after the first rains, it appears as if all the world and his wife had turned out to sow corn. From the wee toddler to the greybeard, all are busy in the sodden fields. The ground is not cleared; indeed, it hardly requires it, for undergrowth there is none, and, with the exception of such stumps of last year's crops as have not been pulled up and used for fuel, the ground is as bare as the palm of one's hand. I did expect, however, that the soil would in some manner get a turnover; but even this was not usually necessary, the old furrows being used again and again. The corn is sown on the top of them in the spaces between last year's stumps, which are, on an average, about 3 feet apart, while the width of the furrows is generally about the same; but this distance varies from 1 to 4 feet, according to the richness or poverty of the soil. The furrows are barred across with earth every 20 to 40 feet, to retain the rain, so that after a heavy shower the whole country appears as if covered with innumerable little reservoirs. One labourer walks with a light hoe, with which he lifts small clods out at the regulation distance. The sower follows him and drops six to twelve grains of the cereal into each hole, pressing back the clod on top of the grain with his foot. The grain ripens in from four to seven months, according to the variety, the Guinea grain taking longest; during this time the ground requires cleaning three or four times. All the population are farmers, with the exception of a few people in the larger towns. The principal crops

raised are Guinea corn, Indian corn, a small cereal called *gero*, wheat, cassava, rice, onions, cotton, indigo, peas and beans of various sorts, sweet potato, ground nuts, and various kitchen vegetables and herbs. The Guinea corn is most prolific, a good head yielding from three to four thousand grains. The corn is ground by the women of the household in the usual slow and laborious oriental style. Some years ago I explained the use of the corn-mill to some chiefs, and asked if they would buy hand-mills if the company sent them out. They looked horrified, and asked where the work for their women folks was to come from; they were wicked and vicious enough as it was, and wanted constant supervision; but without work! I at once changed the subject.

In the more secure portions of Hausaland, the roads are thronged with people, merchants journeying from town to town, trading a little as they go. All the women carry large loads on their heads, and, as a rule, a sturdy baby slung on their back. The bulk of the merchandize, however, is carried on the backs of asses, many of which have bells hung round their necks. When they fall under their loads at bad places on the roads, they lie perfectly still until relieved of their burdens by the drivers, who talk away to them as if they were human, alternately praying over them, entreating, or cursing the poor brutes. Mules, bullocks, and horses are also utilized as beasts of burden, and every farm has at any rate a few brood mares on it; but in the year of our visit, they and their foals were in a most emaciated condition, from the lack of fodder, there being no green grass, while corn was out of the question at the famine prices then ruling.

Fawa, where the grand vizier overtook us, is one of the chief towns of the province of Katsena, and deserves notice as the principal seat of the iron trade in the Hausa States. The smelting furnaces are built into the perpendicular face of an excavation 3 feet deep, the length of it depending, of course, on the number of furnaces. In the one we examined there were twelve. The furnaces are round, having a diameter of 18 inches, and the ashes, slag, and iron are drawn through large openings a few inches above the bottom of the furnace, the top being left open, and the furnace charged from there first with charcoal made from the shea-butter tree, then with the light sandy-looking ore from which the iron is extracted, and then with more charcoal. The blast is produced from two primitive bellows worked by one man. Once lit, the furnace is kept going all day, being continually recharged as the mass sinks down. About 3 cwt. of the ore is required to produce 28 lbs. of iron, each furnace turning out that amount in twelve hours. The ore is dug from mines close to the town, which have extensive galleries, but I did not see them, in spite of having engaged the principal iron-master as a guide, the fact being that he, like others, was afraid to show the white man too much.

At Fawa people had been congregating for a month, to take

advantage of the wuziri's escort through the robber-haunted district which lies between the provinces of Katsena and Sokoto. We started from here, a motley crowd of over two thousand persons, fully half of them women and children. The escort consisted of about three hundred horsemen and one hundred footmen. The latter mostly belonged to Fawa, but the horsemen consisted of detachments from the provinces of Zaria, Kano, and Katsena. The chief of Fawa, who is styled king of the road, took supreme command of these troops as far as Guso, where the wuziri dismissed them, giving them valuable presents and his blessing, which they prized even more highly. This belt of country between Fawa and Guzo may serve as a type of those robber-haunted districts of Hausaland which contrast so strongly with the more settled regions I have previously described. It is a long stretch of uninhabited but for the most part beautifully timbered and fairly well-watered country, and was once very populous; but the emirs of the Katsena province, with their short-sighted policy and slave-raiding, ruined it, so that to-day it is used only as a retreat by the Ambutu and Maradi robbers. For the last seventy years these marauding tribes, although under the rule of Sokoto, have made their annual incursions in thousands, and, as most of them are mounted, move with great rapidity. A few years ago they, in the absence of the neighbouring emir of Zaria, had the audacity to invest his capital for a few weeks, and they have even marched within sight of the walls of Kano. The inhabitants of the smaller towns in Hausaland are thus kept in a state of continual terror during the spring. It may be a matter of surprise why the Sultan of Sokoto does not prevent these raids; and the explanation generally believed is that the founder of the Fulah dynasty, Othman Dan Fodio, left to his successors instructions, which they have found it expedient to obey, to allow these two tribes to continue their yearly raids in order to keep the unruly provinces occupied, and thus divert the minds of the Hausa inhabitants from an otherwise inevitable struggle to shake off the Fulah rule. Whatever truth there may be in this belief, it is certain that the northern Hausas have their hands full of these marauders. Even at Rogo, a fairly large and strongly walled town, I saw the terror that the mere cry of "Maradi" caused. We were camped out in the fields about a mile from the town when the cry was raised, early in the afternoon. A general stampede into the town took place, and until midnight people came flocking in from the outlying hamlets, carrying the most valuable part of their property with them. We ourselves thought it best to get within shelter of the walls. It turned out to be a false alarm, and in a couple of days the people became reassured and returned to their farms. The complete ruin of districts thus given up to robbers may be best shown by the fact that between Fawa and Guzo—a distance of about 70 miles—we did not meet a single human being.

On June 21, near Gandi—not to be confused with Gandu—we struck the course of the Sokoto river, a sluggish stream at this point, and we followed it more or less closely till our arrival at Wurnu, the capital of the Sokoto empire. This town is rather snugly situated in a deep valley running from east to west, but a more desolate-looking spot could hardly have been selected. Even at this time of year there is not a blade of grass to be seen on the sides of the hills, nothing but sand and black hard volcanic rock; the loose rocks and stones are placed in long lines built in dry dyke form on the sides of the hills, giving them the appearance of being terraced, and reminding one of the Canary islands. The corn is just beginning to sprout from the sandy fields, and looks poor indeed compared with that passed a few days ago, or even that of yesterday. We appear to have passed, in a few hours, from a green fertile country to a desert, from spring to tropic winter. At this rate the people can only have about four months spring and autumn, and a long eight months of barren dryness, the greater part of it with exceedingly hot days and bitterly cold nights, and without other fuel for fires than corn-stalks. Sultan Atiku's motive for removing from Sokoto and building his capital here in 1831 was to control more effectively the marauding Goberi and Maradi tribes which lie between Wurnu and the oasis of Asben. At the town gates numerous herds of milch goats were roaming about, but hardly any cattle were to be seen. I should judge the population to be only about 6000, the town having, like Madrid, been artificially created as "La Corte" for political reasons. The town has a good wall round it, and the compounds are mostly in good order; the market is quite a small one. On our arrival at Wurnu we were given good quarters, the same that Joseph Thomson and Sego occupied when here. The sultan at once sent to salute us, sending at the same time a present.

I am not, of course, at liberty to describe my business with the sultan, which occupied five days, beyond saying that I obtained all that the company required. The success and rapidity of the negotiations were doubtless largely due to the intimate friendship that had sprung up between the grand vizier and myself during our long acquaintance. The sultan, who is now about seventy-five years old, showed, when conversing with us, the highest possible mark of his consideration by removing the veil which he wears to hide his face from his subjects, who believe firmly in his divine mission.

It should be clearly understood that the Fulahs, who originally conquered the Hausa States by their military superiority and the advantage that horsemen have over undisciplined foot-soldiers in a level and scantily wooded country, now hold their vast empire of Sokoto through the superstitious dread which they have managed to instil into the Hausas. If it were not for the fear of the Fulah prayers calling down curses on them, the Hausas would at once struggle for

their independence. Both Hausas and Fulahs believe that the founder of the empire, Dan Fodio, possessed supernatural powers, that he ranks next after Christ, and that his power of blessing or banning has descended on his successors. But the Hausas believe also in a prophecy that only thirteen sultans will reign, after which the blessing will depart, and another power will succeed that of the Fulah. The present sultan is the eleventh of his race. The name of Dan Fodio is still invoked—people, when in extremity or great danger, calling out "Shifu." The wuziris, or grand viziers, are descended from the female side of Dan Fodio's family. They hold all real power, the sultans being so completely hedged in by formalities. I should estimate the number of the Fulah race at less than one-sixth of the whole population of the empire, even including those of only partly Fulah blood, who, however, always claim Fulah descent. Probably one-third consists of pure Hausas, and the remaining half of slaves; the latter being continually recruited from the wholly pagan races who live in the mountainous regions that lie within easy raiding distance from the capitals of most of the provinces. Each emir has his own preserves, on which his neighbour is supposed not to encroach. A breach of this etiquette has led to war between emirs in two instances within the last twelve years to my knowledge. This absence of joint action of the Fulah emirs has saved the pagan tribes from entire incorporation with the Sokoto empire. There might be little to regret in their loss of nationality, if they could be incorporated into such provinces as Sokoto, Gandu, or Kano, where, in spite of misgovernment and insecurity which Europeans would find intolerable, new towns are springing up, and the old ones are forced to extend their walls to allow for the increasing population. But the empire is not all ruled in the same manner as these three provinces in which the invading Fulahs found a people—the Hausas—at least as civilized as themselves, whom they conquered, but could not enslave, and where, indeed, the descendants of the old chiefs are often still left in charge of the towns. A very different state of things exists in the non-Hausa portion of the empire, where Fulah rule means the gradual conversion of populous and fertile districts into uninhabited wildernesses.

The question of religion in the Sokoto empire as a whole is too large and complex to be dealt with in these brief notes. I must content myself with remarking that while Mohammedanism, even in the Hausa provinces, is a very thin veneer, the people are extremely superstitious, attaching great influence to charms, of which hundreds are often sewn on their gowns and turbans, while strings of them are worn about the body.

It is well worthy of mention that the court language of Wurnu is not Fulah, but Hausa. This surprised me the more, as Fulah is the court language in provincial capitals, such as Zaria and Yola, the capital of the province of Adamawa.

Leaving Wurnu on June 28, we soon struck again the valley of the Sokoto river, and travelled to Sokoto, the former capital of the empire. Although its wall is 6½ miles in circumference, penetrated by eight gates, its population is only about 10,000 souls, exclusive, of course, of the thousands who flock into its markets. Its only interest now is historical. The tomb of Dan Fodio, the founder of the empire, is just outside the principal mosque, and is preserved with great care, as is also the room in which he died. People are sent twice a year from Wurnu to attend to them. Sokoto is situated on elevated ground, with an extensive marshy plain to the north. Between Wurnu and Sokoto ostriches are plentiful in the farms; but they are a sorry sight at this time of year, as they have recently lost their feathers. We now see great numbers of camels, and we meet numbers of merchants from the oasis of Asben, in the Sahara, the northernmost possession of the Sokoto empire. These men from Asben (otherwise known as Aïr) wear black veils or turbans covering the greater part of the face. The trees in these regions are chiefly gum, dom palms, kuka, tamarinds, and plums. Looking from these confines of the desert, with a fine sandy soil and volcanic rocks, towards the south, we see, as far as the eye can reach, cultivated land divided into fields, and looking like a bit of the old country in the spring-time, while small streams meander through the valleys. Most of the fences are composed of the castor-oil plant. The town walls in this part of the empire are greatly neglected, proving that the inhabitants do not fear the incursions of marauding tribes. To one who, like myself, has lived the greater part of seventeen years in the southern portions of the Sokoto empire, the amount of cultivation in these more northern regions is astonishing.

We reached Gandu on July 3, but only needed to remain there two days, as the Sultan of Sokoto had given me letters for the subordinate sultan or emir of Gandu, containing explicit instructions as to the documents which he was to sign at my request. Our interviews with the Sultan of Gandu were therefore only of a friendly and formal character. He is a tall, imposing-looking man of sixty-five, with the true Fulah features, but a darker complexion than the average of his race. Having obtained from him the documents required in my instructions from London, we left Gandu on July 5, and reached Jega the next day. Workers in iron and leather abound here, and there are large pottery works and extensive dye works outside the town. The market is nearly as large as those of Kano and Sokoto. At the next halting-place, Zara, on the Sokoto river, our expedition divided—Mr. Teed taking canoes with many of the loads, and I continuing the journey to Gomba by land. I should mention that between Gandu and Gomba some five hundred persons, mostly women, took advantage of my escort to travel with me. On July 9 I reached Jiro, near which place, in 1885, some robbers seized a straggling carrier, who, unfortunately, had on his

head most of poor Joseph Thomson's papers; but I was unable to obtain any information, as the inhabitants, though well remembering Thomson, had never heard of the robbery. On July 11 I struck the Niger and crossed to Gomba, on the right bank, the river being about half a mile wide at this point. Gomba belongs to the Gandu division of the Sokoto empire, the Fulahs having succeeded at this place in forcing their way across the Niger, and thus forming an *enclave* in the kingdom of Borgu, which with this exception possesses the whole right bank of the Niger from the frontier of Illorin up to and beyond Illo. The population of Gomba is about 3000, two-thirds of whom are pagans.

On July 13 I sent off most of my carriers and the Sultan of Sokoto's people overland to Leaba, in Borgu, and thence to Lokoja to await my return, and, Mr. Teed arriving in the afternoon, we started up-river in canoes, reaching Gere, the waterside town of Illo, on July 18. Both Gere and Illo are Borgu towns, the chief of Illo being the half-brother of the king of Boussa, the paramount ruler of Borgu; but this chief died on July 19, and it was not then known who would succeed him. On July 26 we left Illo and Gere by canoe for Boussa. I will refer here only to our visit to Yelo, the capital of Yauri, with about 5000 inhabitants. It was the Yauri people who pursued Mungo Park down to Boussa, and caused his death. After passing through numerous rapids, we reached Boussa on August 5. The route between Boussa and the mouth of the Niger was described in a paper read to the Society last year by Captain Lugard, so at this point I will conclude these brief notes. I fear I have conveyed a very inadequate idea of the natural wealth of the region which I traversed, and the remarkable industry of its inhabitants under most adverse conditions. I do not hesitate to say that the only things needed to convert the Central Sudan into another India are peace and freedom.

Before the reading of the papers, the President said: We have this evening the pleasure of welcoming the return from the Niger country of our Vice-President, Sir George Goldie, governor of the Royal Niger Company. I am glad to say that he looks as well, if not better, than he did when he left England. I also have great pleasure in introducing to you the reader of the paper, Mr. Robinson. He went out for the Hausa Association, and reached Kano, the centre of trade in that densely populated Central African region. He has also brought back a mass of native manuscripts, and the material for a grammar and enlarged dictionary. He will read a very interesting account of his journey this evening; and we shall also have another paper by Mr. Wallace, who is still out in the Niger country, on the central portion of Hausaland, a little further to the north. I will now request Mr. Robinson to read his paper.

After the reading of Mr. Robinson's paper, Major Darwin, in introducing Mr. Wallace's paper, said: Mr. Wallace went to the country in 1878, and therefore knows its condition intimately. He is the agent-general of the Niger Company, and as the Niger Company is the representative of British authority over the whole region, therefore it is very clear that Mr. Wallace, the chief

executive authority of the Niger company, has a most important position. There are some chartered companies which have the habit of always bringing their affairs before the public; there are others which seem to keep them in the background; but we must not judge of the relative importance of the regions by the amount we hear about them. Some day the people of this country will wake up to the enormous importance of these Niger regions.

After the reading of Mr. Wallace's paper, the President said: I am sure the meeting will like to hear any remarks which Sir George Goldie will like to make on the paper just read.

Sir GEORGE GOLDIE: After the two interesting papers we have heard, which naturally occupied a rather longer time than most single papers, I shall not detain you more than a few moments. I have taken a particular interest in the papers to-night, from the fact that they emanate from two travellers who view things from distinct points of view. One of them, Mr. Robinson, who was an experienced traveller before he went to the Central Sudan, is a scholar and student; the other, Mr. Wallace, has lived for eighteen years, more or less, in the Niger region, and has been occupied almost entirely with learning, and afterwards carrying into effect, administrative duties there. Thus we have the views of two men on the same region from different points of the compass. I look upon papers such as we have heard to-night as chiefly valuable because they serve to dispel a common illusion about Africa. Some two years ago, a very eminent diplomatist, taking advantage of an after-dinner speech to address two European nations through the press, spoke of the swamps and jungles of tropical Africa as if that vast region, which is perhaps twice as large as Europe, consisted, at any rate mainly, of dense forests peopled by pigmies, or mangrove swamps inhabited by ferocious cannibals. Of course, it was a diplomatic speech for a diplomatic purpose, but it must have been uttered with a full and well-justified confidence in the ignorance of the general public. Now we learn from these papers that the Hausa regions are free of swamp and jungles. We learn that they are, in the first place, very fertile; we learn next that they have highly organized governments, although exceedingly bad ones, which I myself would place on a level with that of our country in the time of King Stephen, and that they possess dense populations, composed of a highly industrious race. This is the special point I wish to emphasize to-night. I would point out that there are probably very few of us—I can answer for myself—who, if we had to work under the conditions in which the natives of these ill-governed countries have to work, if we were uncertain as to what would become of the fruit of our labours, if the earning of wealth would call down upon us attacks which would cost us not only property, but liberty, would not become idlers, whereas these extraordinary people appear content to work for others, and not for themselves. This is worth emphasizing, partly because the ultimate value of tropical Africa must depend on the industry of its native inhabitants, especially where it cannot be permanently settled by Europeans, and partly because it has been the fashion in the press to speak of the insuperable indolence of the African (as if all Africans were alike) as the obstacle which cannot be overcome in developing the continent. I will make only one remark with regard to three points to which Mr. Robinson referred, matters which seem very wide apart, but which really hang together. He referred to the question of currency, to the question of transit, and to the question of slave-raiding. All three are very important points, seemingly unconnected with each other; yet none of them can be settled until European power is firmly established in that country. Those who have had to deal with these regions have long realized that there are only two practicable policies to follow. The one is the summary process which Mr. Robinson, with the generous

impulse of the humane man, intolerant of the horrible indifference to human suffering and of the cruelty he has seen, recommends to us, and which I hope he can recommend sufficiently strongly to the people of this country to induce them to obtain a vote for the necessary millions to carry out that policy; and the other is the policy which has already been followed, the policy of a gradual advance, cutting our coat according to our cloth, making an advance where we can, driving a nail where it will go, pushing ahead where we see a weak place, and drawing back where we find insuperable obstacles. That is the policy, the representative of which in Africa is now Mr. Wallace, and I venture to say, a more capable and more experienced representative could not be found.

The PRESIDENT: Hausaland, of which we have heard such a very interesting account this evening, is a region which has a peculiar interest for this Society. The attention of geographers had been very specially turned to the discoveries of Clapperton, who, I think, died in Sokoto in 1827, and the exploration of Hausaland in the years immediately preceding our foundation, and we may also remember that the first time our royal award was given, it was presented to Richard Lander, the discoverer of the mouth of the Niger, so that when we turn our attention to Hausaland, we turn it to an old love. I remember one of the very first papers I heard read at a meeting of this Society was by Dr. Baikie, R.N., one of the most daring explorers of Hausaland in former years, an abstract of whose papers Sir John Kirk, after carefully examining them, gave us some years afterwards. I very much regret that Sir John Kirk is unable to be present this evening. We must all rejoice, I think, that the continuation of work which was done so well by Dr. Baikie and his contemporaries has now fallen into such excellent hands, and we must congratulate Sir George Goldie on the admirable way in which he and Mr. Wallace, and his other coadjutors, have been carrying forward the labours of their predecessors, and doing most important service to their country. This Society has already expressed its sympathy for the objects of the Hausa Association, for which objects Mr. Robinson has been working for three years. I am confident, and I think we may assure Sir George Goldie and Mr. Robinson, that the papers we have heard this evening will certainly increase that sympathy amongst the Fellows of this Society. It now only remains for me to ask you to pass a cordial vote of thanks to Mr. Robinson and to Mr. Wallace for the valuable papers we have heard to-night, and to Sir George Goldie for his interesting remarks upon them.

EXPEDITION THROUGH SOMALILAND TO LAKE RUDOLF.*

By Dr. A. DONALDSON SMITH.

I accepted an invitation of the Amara chief to spend a night in his village, as I wished to study native customs. I and my ten boys occupied the chief's house. It was a very long wooden building, with a peaked roof covered with grass reaching to the ground. You had to stoop as you entered the one opening, and push aside the grass. Once inside you seemed to be in absolute darkness, but gradually your eyes became accustomed to this, and you could make out a double row of stalls on each side of a long chamber, and a small fire burning at the

* Paper read at the Royal Geographical Society, January 6, 1896. Maps, p. 200. Continued from p. 137.

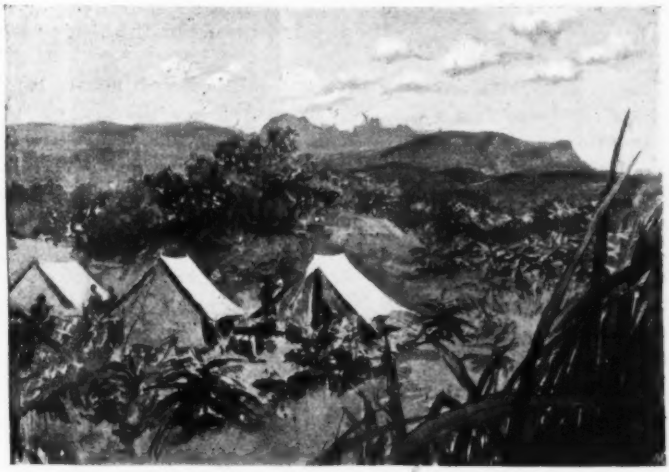
further end. There were many small children running about with their mammas, wives of the chief. The stalls on one side contained a pony, goats, and chickens, while those on the other side were the private apartments of the household. It was raining heavily, and very cold, so I could not go out, but had to sit quietly and endure everything. A goat was killed inside the building at our feet, and a great mess it was cutting him up and cooking him. Bread and meal and honey were brought to be eaten with fingers, and huge pipes and tobacco and coffee. The atmosphere became abominable, and as the great variety of biting insects took possession of you, you hardly thought you were having a good time. I had to sit by the fire all night to keep warm, trying to wage war on the insects. The pony would continually be kicking, probably on account of nibbling rats; and some piccaninny would begin to bawl. Thereupon there would be a chorus of female voices in manly tones, and after a good sound whacking with a goat's leg-bone, the infant would be brought to a state of rest. To cap all, a cock fell from the loft overhead in the middle of the night, and all attempts to quiet his outcries only made him the more terrible.

Going farther on, I came to a large river (50 yards broad, with a current of 4 miles an hour, and 3½ feet deep), which I afterwards found flowing into the northern end of Lake Stefanie, and I discovered that it arose partly from Lake Abaya itself, and partly from the mountains immediately about that lake. Leaving my caravan by the river, I took thirty boys across the high rough Konso range of mountains, where donkeys even could not get along. The Konso people inhabiting the western part of this range are the great weavers of this country, supplying their cloth to the Borans, and all the tribes of this district. We reached on the third day the lovely Lake Abaya, a clear, deep sheet of water 11 miles square, and surrounded on three sides by lofty mountains. The very arduous journey was nearly broken up by a rhino, as we were ascending a very narrow game path. The beast tossed the man just ahead of me, and severely mauled my gun-bearer, who was immediately behind me. I escaped by plunging into a thorn bush. I was obliged to leave five men behind to look after the two wounded fellows, and proceed with the small remainder of my boys, who were in a state of terror the whole time. During my journeys I had four boys hurt by rhinos, and two camels killed.

The elevation of Lake Abaya is 3430 feet. A range of mountains 8000 feet high runs from its western shore south, and connects with the Amara group. This range is inhabited by the Janjams; to the north of the Janjams live the Yero. The Janjams are the most powerful of these people, living up in a hill like the Amara. They weave cloth, and raise not only large crops of cereals, but excellent coffee and tobacco. I have never tasted better coffee than that grown there; they do not trim the plants, but let them grow naturally.

To the north of the lake live the Gonjabelo, the Busia, and Jeratu. All these tribes are agriculturalists, except the Busia, who live by plunder and the chase. From an elevation of over 5000 feet on the Konso range, I got a very extended view of the country to the north and north-west. I could count peak after peak rising up to the height of 9000 feet (about), but there was no great mountain, as has been reported, towering up to 16,000 feet. These highlands are the continuation of the great watershed I reached west of Sheikh Husein, and form a broad high wall between east and west as they run down towards Lake Rudolf.

With regard to the weighty question of the course of the Omo river, which has been seen by Borelli about 70 miles to the north of Lake



NEAR ASEBA, UNINHABITED PART OF BORAN COUNTRY.

Abaya, and on the eastern aspect of the great saddle-backed wall, I cannot imagine that there could be any fissure deep enough to permit a river to take a sudden bend to the west and cross the mountain chain. The Omo must flow east, and I believe it to be identical with the Jub river. From what information I could collect, I gathered that the river Daua rises immediately north of the Janjam. My opinion with regard to the Omo was much strengthened when I explored the river Nianam a long way north of Lake Rudolf.

After collecting some fishes and other zoological specimens, and surveying the lake, we returned to camp, and tried to follow the river west; but after three marches we had to abandon the river valley, and make our way up to the Tertala plateau lands. Passing through a

lovely grazing country covered with cattle, from an elevation of nearly 5000 feet to a little less than 1700 feet, we found ourselves by Lake Stefanie on the last day of May. The upper end of Lake Stefanie is a marsh, and a long line of reeds extends for a distance of 5 miles into the lake near the western shore. The lake resembles a boot in shape. On its eastern and western sides it is surrounded by lofty mountains; the Tertala range on its eastern side ends abruptly about a mile and a half from the shore, but a low line of hills is continued from the range to what we may call the heel of the boot. Immediately off this are eight islands, mere rocky masses which form sanctuaries for millions of aquatic birds. I took several soundings far out in the lake, but did not find the water over 25 feet deep in any part. There are no people living immediately on the lake except at the north-west corner, but the mountain range on the western side is inhabited on its higher slopes by a part of the Amar tribe. The lake is 37 miles long and 15 miles wide.

The river flowing into the northern end had such muddy banks that we concluded that the longest way round was the shortest way across, so down the lake we marched, and up again on the western side. I must say that we were rejoiced to find the water of the lake quite fresh. Besides the ubiquitous rhinos, there were a few naked savages living about the mountains to the west of the lake, who would make a sudden rush with the idea that they could frighten us. They would turn, however, and bolt, after threatening us with javelins and bows and arrows in an amusing fashion. They belonged to a division of the Amar. We found a little lake, 10 miles long and very narrow, extending north from the north-western extremity of Lake Stefanie, and probably connected with this during the rains. I have named this "Lake Donaldson."

We were to undergo another uncomfortable bit of excitement. We came to a large and warlike tribe called the Arbore, inhabiting half of the valley above Lake Stefanie. We had no guides, and were most anxious for the Arbore to let us have one of their number to help us north. They pretended they would do so, and kept us waiting for some time; but, instead of getting guides, they were preparing for a great attempt to loot our caravan. On the third day we found ourselves surrounded on all sides by a yelling, dancing crowd, throwing javelins and letting fly their arrows. Like the Borans, they had but simple weapons, and now hearing for the first time the whizzing of the bullets and the terrifying sound of the firing, they soon fled. In great contrast to the Arbore, the many little tribes we met as we went further north received us with every show of friendship. They were the Burle, Dume, Mali, and Borali in succession towards the north, and then the Bunno, Dime, Ario, and Amar to the west.

The Burle are the next powerful race to the Arbore. They are

agriculturalists, besides owning many flocks of sheep and goats. The chief of the Burle was also head of the Dume, or tribe of pigmies, his warriors having conquered the little people about eight years ago. The Mali and Borali live to the north-east of the Duma, and number about eight thousand. They are great fighters, and continually waging war on their neighbours. Like all the tribes of this region, they are naked and very black, but they are not burly like the Seedy Boys; they use poisoned arrows. Their average height is about 5 feet 7 inches. They do not possess beads or brass to any extent. The Bunno occupy a long narrow valley 30 miles to the north-west of Lake Stefanie. Two-thirds of these people are very small and resemble the Dume, but the other third are of the ordinary height. It would seem that the race

LAKE STEFANIE, FROM NORTH-EAST CORNER.

was originally a pigmy tribe, but that intermarriage with their neighbours has partially destroyed this characteristic.

I can only attempt this evening to give you a short account of one of these tribes, the Dume, although they were all very interesting. These Dume are dwarfs, their average height being only 5 feet—we saw none over 5 feet 2 inches—woolly-haired, and very black, with flat noses and large lips. They resemble other dwarf tribes found in Africa, but they have very graceful, well-formed bodies. They are quite naked, and do not even care to wear sandals. Bows and poisoned arrows are their principal weapons. Beads were scarce among them; but they had managed to possess themselves of some zinc, out of which they had cut large discs to hang from their noses and over their ears and foreheads. They lived in little hamlets composed of about fifty small huts each, and scattered among the mountains. The huts were low conical structures made of stocks, and covered with grass. They owned goats and sheep, and raised a little millet. We got to like these little people exceedingly, as they were very amiable and jolly. The interest

they took in the two white men was very amusing. They wondered at our curious method of eating; at our method of catching insects and snakes to live upon, as they thought; and at our washing, when we had already scrubbed all the black skin from our bodies.

The rough mountainous country presented every obstacle to our progress. There were no roads, and we had to make paths over ridges 2000 feet above the surrounding country. On July 4 we found ourselves without guides in such a bushy country, that we were obliged to make five long marches in the bed of a river knee-deep in water the whole time. As our boots were wearing out, we were forced to walk barefooted; but our spirits ran high—Lake Rudolf was near, and we were to be the first to reach it from the east. As Prince Boris said to me, "I believe the ghost of Prince Rudolf has been guarding that lake since Count Teleki's expedition. How many have tried to reach it, and none succeeded!" A little bit more pushing, and our joy was complete! After more than a year's wanderings in all sorts of country, and under most diverse circumstances, we found ourselves at the goal of our ambition. We reached Lake Rudolf on July 14, 1895, and camped among the Reshiat, a tribe living at the north-east corner of the lake. The expedition had been a hard one, but we had achieved all we had set out to do, and more.

The Reshiat people were not in the same thriving condition as they were in 1888, when Count Teleki discovered them; a disease had killed off all their cattle, and the Borans had seized their donkeys. There was much more water in the lake, and, except at its southern end, we could detect no salty flavour whatever.

Lake Rudolf does not appear like a long sheet of water lying in an abrupt cut or fissure in the Earth's surface, as I had anticipated. On the contrary, it is very much spread out, except at its southern end. It lies in a shallow sort of basin in an open country that slopes very gradually towards the Tana river from its south-east end and the mouth of the Jub, and there is continued in a north-westerly direction as an almost level plain to the valley of the Nile. The river Nianam cannot be said to flow in a valley for a distance of more than a degree north of the lake, but it pursues a very even course through a flat country cut at rare intervals by low narrow mountain chains running towards the south-west. The fall is only 400 feet in 70 geographical miles. The southern end of the lake, however, marks the rather abrupt termination of the great mountain system extending north from Mount Kenya, while 20 miles to the north-east the highlands running down from Abyssinia begin to disappear rapidly. A narrow mountain chain is continued up from the south along the western shore of the lake to near its northern end, and this is the only thing that relieves the monotonous and flat appearance of the upper lake region. There are few trees, and the open grassy plains seem to vie with the water and the barren rocks in producing a

most disagreeable glare as long as the scorching sun is above the horizon. I found the lake to vary in depth from 2 to 25 feet; its elevation is 1240 feet above sea-level. There was no broad sandy beach as Count Teleki had found in 1888, for there had been plenty of rain a little while before our arrival, and the water was high up among the bushes.

About midway down the eastern shore is a little group of mountains called Longendoti; and just to the north of these is a large bay, where some 300 Elmolo, or fishermen, are living on little islands near the shore. The main body of the Elmolo, numbering about 700 souls, are living on the mainland not far from Mount Kulol. There are many people of Reshiat who have been obliged to support themselves entirely by fishing since the cattle disease which some four years ago

BRIDGE MADE BY MELA ACROSS NORTHERN TRIBUTARY OF THE NIANAM.

devastated the country, and hamlets of two or three huts are common along the lake-shore. I will mention that, although these people live entirely on fish, I did not see a case of leprosy among them. The only two cases of leprosy I saw on my journey were among people who never touched fish—one at Bari on the Shebeli river, and the other in the Boran country.

Passing on to the south, we get into very rough country. At the south-west end of the lake there is an active volcano, and all around are evidences of volcanic action. We had to make our way over great masses of volcanic *débris*, and over a country cut up by countless fissures, where there is scarcely a blade of grass.

And now we come to Mount Kulol, the most remarkable mass I have ever seen. It is nearly 6000 feet high, and cracked from top to bottom. The fissure is only about 20 yards wide, and from the bottom

one can scarcely distinguish individual trees at the top, so high are the vertical walls on each side of you. There is one island near the lower end of the lake, 10 miles long, which contains many craters, just as if it had been intended as a gigantic sieve for the products of the terrific subterranean combustion that has cracked and tossed the earth and rocks about into chaotic masses all over this section of the country.

It had been Count Teleki's intention to explore the valley of the Nianam, supposed to be the Omo river; but he had been deterred, owing to the hostile attitude of the natives. Reports that reached my ears were not reassuring, but they were not so bad as to preclude reasonable hopes of success. We had got so accustomed to rushing about in all sorts of unknown parts, that we had no nerves left. Leaving the caravan on July 19 at the Reshiat, in charge of Dodson and my head-man, I set out for the north, with twenty-nine rifles and a few donkeys. We only reached as far north as the Murle, an agricultural people numbering some ten thousand souls, living 20 miles above the lake. I was seized with such a severe attack of fever, that I had to be brought back to the caravan. Recovering almost immediately, I made a second attempt to ascend the river valley, with successful results. The journey lasted a fortnight, during which we were on the march ten hours daily, and a rough and exciting time we had. From Reshiat to the Gumba, a distance of 50 miles, we passed village after village in rapid succession. Many of the tribes would don their war-paint and feathers to receive us. For a few hours, while we were among the Kere people, the situation looked very serious for our little caravan. Over a thousand warriors seemed on the point of attacking us; but our friendly, and at the same time confident, demeanour had the effect of quieting all hostile desires. I attribute our success more to the absolute confidence we displayed in ourselves than to anything else. The very idea of thirty men marching straight along through a country teeming with hostile tribes seemed nothing less than miraculous to the native mind. To the Gumba people we had fairly good roads, but now our troubles began. The natives told us that beyond them there was nothing but bushes, marshes, and forests, through which none of them had been able to pass. They could not give us guides, as they said there was no possibility of our going on. They knew of no tribes whatever to the north.

For three whole days, working from daylight until night, we had literally to push our way along. The Nianam kept to a straight course north and south, and did not make a great bend to the west, as had been supposed. At one time we would be forcing our way through dry weeds 8 feet high, that would be continually casting showers of irritating seeds in our eyes; at another time we would have to crawl through forests so dark that we could not recognize faces a few feet away. There were two

rivers to cross that emptied into the Nianam from the east, and several marshes shedding forth great clouds of mosquitos. It was with the greatest difficulty I could get my boys to follow me, and when on the third evening we had lain down exhausted in a little opening among the bushes without having seen a sign of human life, the prospects seemed poor indeed. We were not to get any rest that night, however. No sooner had our camp fires been started, than war-horns were sounded on all sides. Every instant during the night we expected an attack, but the morning came, and we were able to continue our journey slowly and guardedly through the bushes without having seen a native. To our surprise, we suddenly found ourselves at the commencement of a lovely open valley, where the ripe durrha was waving to and fro, and goats were nibbling at the soft green grass, and noises, too, from a score

RIVER NIANAM AND MOUNT SMITH, LOOKING NORTH FROM HILL ABOVE MELA.

of villages reached our ears. Two old men and a woman were waiting to receive us. After a long shauri conducted by signs only, and some loud calls on the part of the old woman, hundreds of warriors emerged from the cornfields, and, casting aside their weapons, advanced to make peace with us. Everything went smoothly; we found these natives—who called themselves the Mela—the most sociable and hospitable black people we had yet seen. I cannot enter into detailed description. They were very black and of medium height, and naked like all the people of this country, but they were far above the average in civilization. Their ornaments and articles of daily use were wonderfully well made; having come into contact with no native traders, they possessed nothing in the way of beads or brass. They almost fought with one another to sell us anything they had for a string or two of the cheaper sort of beads. We bought supplies of coffee, meal, and tobacco, and some ivory.

We were now 70 geographical miles north of Lake Rudolf, so I

determined to ascend a mountain range a little west of the Mela, and see what I could of the surrounding country; but we had to cross the second tributary of the Nianam to do so. I observed the river Nianam, now only 35 yards wide, rushing down from the highlands of Kaffa, 40 miles to our north. It does not require a great extent of high mountainous country, where there is almost a continuous rainfall, to produce a river of this size. The origin of the Nianam must be in those mountains 9000 feet above the sea, and lying 120 miles north of Lake Rudolf. We were at the western edge of the great watershed, around which we had been circling for so many months. The country to the west was a great undulating, grassy, and almost treeless plain, with only two mountain chains visible: one running north-east by south-west, with its nearest point 35 miles off, and another further south and 70 miles off, running in the same direction. They were not more than 4500 feet high, or 2700 feet above the surrounding plain. The country to the west is inhabited by the Merdu, or Meritu, while to the north live the Galo, Mega, and Mala. Having gained much information regarding the surrounding country from personal observation and from reports of our friends the Mela, we retraced our steps to Reshiat.

A journey round the northern end of Lake Rudolf, which I made by land, and Dodson accomplished in our little collapsible Berthon boat, disclosed the fact that the Nianam is the only river emptying into the lake, and that there is no river Bass, as supposed by Count Teleki.

We left Reshiat August 8, and marched 200 miles south along the eastern shore to Mount Kulol. Here we rested the camels and donkeys for a few days preparatory to exploring the unknown country to the east. Teleki volcano sent up great clouds of smoke, and seemed to be very active, from the glow of the lava at night-time. When we started again, we little knew what sufferings we and our poor animals were soon to endure. Marching consisted in scrambling over rocks stuck on end, and almost lifting our animals over great masses of volcanic *débris*. Our Elmolo guides deserted, and we did not find water on the second day as we had expected. For four days this sort of thing continued, and, in spite of all our care, the last day was spent in continuous labour without a drink for any one. If we had not found water in the middle of the fissure which splits Mount Kulol in two, we should certainly have been lost. As it was, many of my boys hid themselves, expecting to die, along the road, and were not found till late in the night. One poor fellow was picked up the following day, but he recovered after a short time, as did all the others. Many of the animals had died, and the remainder were in a frightful condition. On September 6 we were among the Rendile, a nomadic tribe, we first found 60 miles east of Lake Rudolf. They were very light-coloured, and resembled the Somali, except that

they were more stoutly built. It was fortunate that, when we needed assistance most, we discovered this lot of good people. They had camels by the thousand, and camels of a far superior breed to the Somali animal. But what was most astonishing, they were willing to part with them. We exchanged all our older camels, with some cloth and beads, for thirty-three excellent fresh beasts—enough to last us to the coast. I believe one reason why the Rendile welcomed me so heartily was because they had heard of the kindness shown by Mr. Astor Chanler towards the natives when that gentleman had passed along the Guaso Nyiro, a river flowing eleven marches to the south.

The country was generally flat, with here and there a low hill

ALONG LAKE RUDOLF.

and isolated rocky mountains; but there were two mountain groups to the east, rising 3000 feet above the surrounding country, covered with forest and sloping green pastures that made a striking contrast to the dried-up appearance of the plain. One of these was called Koroli, and the other Marsabit. Water is to be had at rare intervals only in this country, it being much worse than Somaliland in this respect.

After leaving the Rendile, the next water to be obtained was in the crater on the top of Mount Marsabit, 30 miles south-east. According to European ideas, nothing could be more charming than this Marsabit. Surrounded by a large forest, and lying at the top of the mountain, is a lake a mile square, clear and deep. The jagged walls of the crater form a semicircle about it, while from another side a broad road leads out through the forest to the open meadows beyond. The atmosphere is moist and cool. In the early mornings dense clouds are swept along by invigorating blasts of cold air, and with the dew of night freshen up

the plants and trees. Outside the forest the view is superb. For 5 miles there is a series of green meadows sloping gradually downwards, on which are grazing many sheep and goats; while far off to the west beyond the yellow plain rises rugged Kulol, and a still greater mountain below it—Mount Njaro. Living on Marsabit were many Masai as well as Rendile.

On leaving Marsabit, we were destined to travel many days through a dreary, monotonous country; the only people we met were Wandorrobbo, or poor people living entirely by hunting. Water could only be found at long intervals. Finally, after marching 150 miles south of Marsabit, we reached the Guaso Nyiro river on September 23, and joined our line of march with that of Mr. Astor Chanler, who had passed along at right angles to us, and followed the river to its termination in the Lorian lake or swamp. Here one of my boys was so injured by a crocodile that I was forced to amputate his arm. After following the river a short distance east, we again turned south across the same barren, bushy sort of country we had just left—only worse. For six days we kept zigzagging around bushes with no guide or path, working from three o'clock in the morning till two or three in the afternoon daily, and on October 7 found ourselves on the banks of the Tana river by Korokoro. We were out of the unknown regions, but still the country was very wild. The natives fled from us at first, and we could get neither guides nor canoes. There were no roads, and the country in many places was very bushy. I expected it would take us a month before we could accomplish the 300 miles of marching yet before us.

Again the good fortune that had followed us in our journeys did not desert us. The eighth white man that had been up the river to Korokoro now appeared; the Rev. Robert Ormerod, an English missionary who had been making a journey in canoes, was just passing on his homeward course. Thanks to his assistance, we were able to procure canoes and canoemen. Mr. Ormerod told me there would be a steamer at Lamu about the last of October. There was little time, but I determined not to have to wait a month in Lamu; so, bundling many of the loads in canoes to lighten the camels, we started for a race. In a fortnight we were on the coast, having made our long journey along the river in that time. We reached Lamu October 25, 1895, and had two days to wait for the steamer that was to convey us all to Aden.

I wish to state that the English officials, as a rule, both at Aden and on the coast, treated me most courteously, and that I feel especially indebted to Captain A. L. Rogers, Resident at Lamu, for his kind hospitality and assistance.

I would like to tell you of all the natural-history specimens collected on the expedition, but they have not had time to be completely classified. Of the seven hundred birds that I brought back, twenty-four have

been described by Dr. Bowdler Sharpe of the British Museum as being new to science. Many new specimens of plants, reptiles, and batrachia, fishes and myriopods have also been described. Besides these, the collection included about 3000 species of insects, many mammals, and some interesting geological specimens. I have presented the types of most of the new species to the British Museum of natural history, and I also intend giving a good collection to the Academy of Natural Sciences at Philadelphia.

Besides being very pleased with the results of my expedition, both from a geographical and natural-history standpoint, I am most gratified to think that only six of my faithful followers died during the sixteen months we were in the jungle, and that when we landed in England a month ago, Mr. Dodson was in even better health than when he had started for Aden a year and a half previously. In spite of the 4000 miles of marching, and all the trouble we had had to undergo, we could not say adieu to Africa, but *au revoir*.

Before the reading of the paper, the CHAIRMAN (Sir GEORGE TAUBMAN GOLDIE, K.C.M.G., Vice-President) said: I am informed that there is likely to be a considerable number of speakers after Dr. Donaldson Smith's paper has been read, and I think we shall have to enforce a five minutes' rule, in order that we may get home to-night. Your chairman, therefore, ought to set the example of brevity, and I propose to make no preliminary remarks, but call on Dr. Donaldson Smith to read his paper.

After the reading of the paper, the following discussion took place:—

The CHAIRMAN: In following our usual practice, and inviting discussion upon the remarkable paper which we have just heard read, we can have no question as to whom we should first turn. We have present to-night his Excellency the Ambassador of the United States. Now, Dr. Donaldson Smith is a member of that Western half of the English-speaking people, to whom we here in Great Britain are united by the strongest, by the most powerful ties that can bind man to man. Common speech, common literature, which lead to identical modes of thought and identical views of life, are too deeply embedded in human nature to be shaken or even seriously impaired by any passing disputes as to material interests. His Excellency is well aware that distinguished American explorers like Dr. Donaldson Smith are welcome here, not only as representatives of science, which in a minor degree "makes the whole world kin," but also as "bone of our bone, and flesh of our flesh." I beg to call upon the American Ambassador.

Mr. BAYARD: I am most fortunate that the accident of my representing my country brought me here to-night. It has been a most interesting occasion. What we have heard has come to us as from another planet. A new country has been suddenly expanded to our eyes, and a campaign has been opened, a campaign of mind against matter. It is not a campaign of profit; there is not one word that has been said to-night, not one word in the proof-sheet placed in our hands, that is degraded by the suggestion of profit, or mere utility. It has been something higher and far nobler; it has been an effort to develop to our limited knowledge a better understanding of the world in which we live. There has been no thought of trade by my countryman, whom I am so glad to find the expositor of such thoughts. He has not uttered one thought of injustice or

oppression, of personal selfishness, or of any lower or more cruel motive. It has been, upon his part, an honest, brave, modest endeavour to let all the world know something of distant regions of which nothing seems to have been known before. In such a struggle, and for such an end, I am rejoiced to find my countryman, an American, a pioneer and an expositor. I have been much impressed by what I have heard; I have rejoiced to find you citizens of Great Britain welcoming here, with an honour which is well deserved, the enterprise and courage of our race on the other side of the Atlantic. Ladies and gentlemen, there perhaps has been no time better than this for every man who cares for the great objects of our civilization, to rejoice, when the hearts of the people on both sides of the Atlantic beat together in a common cause, and that cause the elevation of our race and the higher civilization of humanity. The story told in this simple adventure is eloquent beyond words. The fact of this handful, this little handful, of men of our race, whom you may count upon the fingers of one hand, starting into the unknown continent, and marching bravely under the banner of intellect, cultivation, and education, into regions where neither intellect nor cultivation nor education had a place, and yet, by virtue of these things, feeling themselves in the mastery, not for gain or conquest, as I have said, but for the purpose of unfolding a knowledge of the world in which we live. I beg pardon that I have said so much, but I have spoken just what I felt, and I believe what you have felt. I am glad, and you will permit me to say I am proud, that an American has spoken here to-night, and that I, as a representative of his country, am here to thank him for it, and to express my obligation to you for having listened to him.

The CHAIRMAN: While we are living in the present, we must not forget the past. Ten years ago, Somaliland was first attacked by an expedition of the late Mr. Frank James. There is present Mr. Lort Phillips, one of those who were with Mr. James, and I think he is a proper person to speak to us to-night.

Mr. E. LORT PHILLIPS: We have all listened to-night with the greatest interest to Dr. Donaldson Smith's account of his most successful journey through the totally unknown region lying between Bari, on the Webi Shebeli, and Lakes Stefanie and Rudolf. I can scarcely believe that ten years have elapsed since my late friend, Mr. F. L. James, stood on this platform and read an account of our journey through the then unexplored country between Berbera and the Webi. Great changes have taken place since then. We found the country inhabited by roving tribes of nomads, possessing large flocks and herds, and whose greatest idea of happiness seemed to be a cattle-lifting raid. Seeing that we were strong and well armed, they naturally thought at first that we had come to enrich ourselves at their expense, and prepared to resist us accordingly. However, when they found that, notwithstanding our strength, we took nothing from them except what we paid for, their hostility turned to welcome, and now every shooting expedition that has since visited the country is received by the natives with the greatest joy. They gladly bring all they have to sell, and seem anxious to show sport. So dangerous was the country considered only ten years ago, that a special message was sent from the Foreign Office to the authorities at Aden to forbid our going into the interior. Luckily for us, however, the message did not reach us till we were already some distance in the interior, so we chose to misunderstand it. That was the first year of the British occupation. Since then great changes have taken place for the better. Previously no caravan dared to move without a strong escort, and even then they were liable to be looted in the rocky passes of the Gulis mountains, when the men's whole time was taken up in assisting the laden camels up and down what were then little better than rocky "staircases." Now beautiful roads have been engineered, down

which one might almost ride a bicycle, while the feeling of security is so great that I have seen owners of caravans strolling along with a small stick in their hands, their spears and shields being tied in a bundle on the camel's back, a fact that hardly a Somal would have thought possible ten years ago. Early last year I started, accompanied by my wife, Miss Edith Cole, Mr. Aylmer, and Mr. Gunnis, and spent three delightful months among the Gulis mountains, which will, I feel confident, at no distant period, become a sanatorium for the garrison at Aden, or even for those with weak chests; a charming country which I consider as safe, if not safer than Piccadilly in the season.

Sir William H. Flower: The last time I had the pleasure of attending a meeting of this Society, towards the close of last session, I was called upon by the President to make some remarks upon the paper which had been read. I hardly knew why, and was obliged to confess that I had nothing to say, because the gentleman who read the paper had not given an opening for a word upon any subject of which I was cognisant. He had certainly made a most interesting exploration, and had brought before us much valuable information upon geographical and archæological subjects, but had told us nothing of natural history, nor brought home a single specimen. On this occasion, it is quite different, because Dr. Donaldson Smith, before starting upon his expedition, had equipped himself in an admirable manner, not only for geographical, but also for zoological exploration. He very wisely took with him a successful and accomplished taxidermist, Mr. Dodson, and we take some credit to ourselves at the Natural History Museum for having recommended him, for he proved not only an agreeable companion, but also a most hard-working and skilful preserver of the various animals of different kinds Dr. Smith was able to collect on the journey. A large number of these specimens you will see after the meeting, exhibited in the adjoining room. The collection is a valuable one from many points of view. It has as yet been only very partially worked out; indeed, a considerable part of it was only unpacked a few days ago.

The chief anthropological interest in Dr. Donaldson Smith's paper is the mention of pigmy tribes further north than they have hitherto been met with. They, however, appear to differ from the true pigmy races of Central Africa in their perfectly black colour and considerably greater stature, and are therefore probably a mixed race. Among the mammals brought home is a new species of ichneumon, and an example of the very rare crested rat (*Lophiomys*).

Of birds, there are over 700 specimens. These have been examined by Dr. R. B. Sharpe, who has found no less than 24 species among them which were previously unknown to science. Of reptiles and batrachians, there are 300 specimens, of which, according to Mr. Boulenger, 11 are new. The fish, about 75 in number, belong to 18 species, of which 4 are new. Dr. Günther, who has examined them, remarks upon the great similarity of the fish fauna of Lakes Rudolf and Stefanie to that of the upper Nile. Of 8 species from these lakes, 6 are identical with Nile fish. Of insects an immense collection has been brought home, including as many as 6000 specimens. Some of the butterflies have been described by Miss Sharpe, but the rest have not been worked out.

I am happy to be able to add that Dr. Donaldson Smith has very liberally presented the types of all the new species of birds in his collection to the British Museum, as well as some other specimens, including an interesting collection of plants containing several quite new forms, which will shortly be described by members of the staff of the botanical department of the museum.

A collection of this kind must not be valued only by the number of new species it contains, but also by the number of specimens of known species in good preservation, with carefully recorded localities and dates, as this makes the collection

important from a geographical as well as a zoological point of view. Each animal and plant has a distribution of its own, dependent, no doubt, upon some physical conditions of the Earth's surface, at present most imperfectly known to us. The study of these conditions is part of the geographer's work, and it can only be fully accomplished when the exact range of distribution of all animals and plants has been determined. Such collections as those made by Dr. Donaldson Smith are essential factors in obtaining this knowledge, and therefore, as I said before, are as important to geographers as they are to zoologists.

Dr. Bowdlee-Sharpe: I think Sir William Flower has said almost everything that need be said upon the subject of the geographical discoveries of my friend Dr. Donaldson Smith. At the same time, I would just like to say one or two words with regard to the birds. One very important new fact which I think he has established by this collection is of great interest, concerning the natural regions into which Africa can be divided. It is certainly very curious to find that, in Somaliland, the nearest affinities to the birds of the country are not as you might expect, belonging to North-East Africa, Abyssinia, or East Africa, but Somaliland proper contains numbers of species and genera which find their closest allies in the fauna of the Cape—a most extraordinary and, to me, unexpected discovery. When Dr. Donaldson Smith crossed the Shebeli river, he tapped the East African flora, and the birds brought from these wonderful journeys by Lake Rudolf and down to the Tana have not yielded anything like the new results which his explorations in Somaliland did. It was not altogether unexpected by me that, when he got to the lakes, he would find the same fauna as on the other lakes; but to find twenty-four new species in Somaliland was—coming on the new species discovered by Mr. Lort Phillips—certainly wonderful. You have got to travel a long way, and work very hard, to get twenty-four new species in a collection, which the British Museum does not possess. Dr. Donaldson Smith did this, and, though it has not been mentioned, I think it should be, that he has very generously presented to our national museum the type specimens of his new species, in return for what he is pleased to call our hard work on his behalf—we rather think, of his hard work on our behalf.

Mr. John Coles: I have very great pleasure in saying a few words about the observations taken by Dr. Donaldson Smith for fixing positions along his route. When Dr. Donaldson Smith determined to make this very interesting journey, so successfully performed, he made up his mind that it would be no good trying to make a mere itinerary without being able to fix his positions, to show us where he had gone, and, having made the determination, he set to work in a most hearty manner. I can bear witness, from the time he came to me, both in observing the stars at night and in surveying the country, that he gave his whole and undivided attention to the subject, and, if he had not done so, he could not have produced these very excellent results. The instruments he used were a sextant and artificial horizon, and a 6-inch transit theodolite. His observations for latitude by meridian altitudes of the sun and stars, and for longitude by the sun and stars east and west, throughout the journey, are most creditable. It is very interesting to find that the rate of his watch, when he handed it to me, after allowing for a small temperature correction, agreed with the rate obtained by Dr. Smith by observation during his journey. I can say, after looking over his work, that I have seldom seen any better work done by any traveller. It is an example of good, honest, painstaking work, recorded in such a manner that any person who understands computation can at once judge of the value of the observations. I have followed him right round from Barí to Lamu, and day by day his work places him in the correct position. What is more, on arriving at the coast he made his longitude agree, within a very few minutes, with that fixed by the Admiralty. I don't think I

will take up any more of your time, but I may say that the example set by Dr. Smith is a very good one. If travellers will only take observations and record them in the same manner, we shall find their work more valuable and reliable. Your work, Dr. Donaldson Smith, is very creditable to you, and it is extremely encouraging to me, your instructor.

Mr. F. W. A. H. Gillett: I wish to express my admiration for the persevering way in which Dr. Donaldson Smith mapped out the country, in spite of the broiling and enervating climate, tiring marches, and the inaccurate reports given by natives, unaccustomed to precision. Before leaving this platform, in case you are going away with a too exalted idea of the advantages of the theodolite, I will give you a short story to show you the disadvantages in a country where the natives give it powers of information which we glean from the maps. A native came and offered to take me to shoot elephants. I journeyed for twenty-five miles, and the following day he took me out to show me the track of an elephant two months old, and told me to look at it with my instrument and see where the elephant was. At first I felt inclined to annihilate him, but, seeing from his face that he was in earnest and there was no humbug, I told him it was no use my looking at it. He said, "The doctor looks into his instrument, and afterwards he says, 'What do you call a place 100 miles in that direction? How many days does it take to reach a large lake in that direction?'" Not wishing to lose the man's respect, I set up the camera, and, turning to him, said very gravely, "This elephant has bad tusks, and one is broken, and as he is very far away, I will return to camp." So, owing to Dr. Smith's theodolite, I had a journey of 50 miles for nothing, except the pleasure of telling you the story to-night.

Dr. H. G. Schlichter: Among the results of Dr. Donaldson Smith's journey there is, ethnologically, none of greater interest and importance than his discovery of the Dume dwarfs, in the region north of Lake Stefanie. Dwarf tribes have recently been discovered, as you know, in many parts of the Congo basin, as well as on the West Coast of Equatorial Africa and in the Upper Nile regions. Moreover, some of them have been found west of the Upper Zambezi, and I think I have shown that the genuine Bushmen of South Africa belong likewise to them. All these pigmies live scattered among the other native races (Bantu, Nuba, etc.), and are totally different from them as regards the principal ethnological features. The average height of the African pigmies is, of course, a question of great importance. I have carefully collected all the available measurements and critically compared them as regards their trustworthiness, the number of individuals measured, etc., and I have come to the definite conclusion that, the whole of our present knowledge of the African pigmies taken together, we must give them an average height of between $4\frac{1}{2}$ and 5 feet. Numerous observations of our best authorities point to this fact. Nevertheless, the pigmies generally give the impression of well-proportioned and strong men. Their mode of living varies according to the character of the country which they inhabit, but their principal occupation seems to be hunting, and their characteristic weapons are bows and poisoned arrows. They live in small conical or beehive-like huts of the most primitive construction, and they invariably inhabit mountainous or forest-covered or similar parts of the country, difficult of access.

The colour of the different dwarf tribes varies considerably. Some of them are described as brown, others as black; and Stuhlmann, as well as myself and others, came to the conclusion that in certain cases the race is not pure. Now, before Dr. Donaldson Smith's journey no dwarf tribes had ever been discovered in the vast territories east of the Nile, although they were found to be pretty frequent west and south-west of this river. But in the course of my own studies on the African

pigmies, I found scattered in the reports of various reliable travellers—for instance, Harris, Avanchers, Krapf, d'Abbadie, and Hartmann—information about hypothetical pigmies living south of Abyssinia, and when I came to compare and criticize the reports of the different authors and their trustworthiness, I became convinced that these reports could not be without some actual foundation; and as the exploration of the countries south of Abyssinia proceeded, my information on these not yet discovered dwarfs became supplemented, and the limits of the area where they might be found more restricted and definite. Thus I was enabled, in a paper which I published four years ago, to distinctly predict the existence of these East African dwarfs, and to fix their probable locality as lying between 5° and 6° N. lat. and between 36° and 38° E. long. Greenwich. I said at that time, "I feel confident that I shall not be committing any serious error in affirming that these regions are inhabited by pigmies, who are probably scattered among other tribes of different race and customs, similarly to their relatives in West and Central Africa."

From what we have heard this evening from Dr. Donaldson Smith, it is clear that he found his dwarfs, the Dume, exactly on the spot indicated by me. It is impossible to under-estimate the importance of Dr. Donaldson Smith's discovery. It lies in the fact that we must now make a very large addition to the area over which the pigmy tribes are scattered, and it greatly strengthens the theory, that the African pigmies are by no means degenerate specimens of the tribes among which they live, but that they are the last remnants of the first and original population of the Dark Continent. Dr. Donaldson Smith's observations are in complete accordance with the views of our other authorities who have studied the African pigmies on the spot, and who have all strongly objected to the assumption that we have in the pigmies degenerate Bantu or other tribes before us. But it is, of course, quite natural that we do not always find the *pure* aborigines. Such a mixed race are, *e.g.*, Casati's Monbuttu Tiki-Tiki, and many difficulties which puzzle us at present about the Bushmen, Akka, and others, are doubtless the result of this fact. Who would have thought twenty years ago that pigmy tribes exist all over Central Africa, from the Ogowe to the Omo, and from Lake Stefanie to the Kalahari desert?

Mr. E. G. Ravenstein: It is very late, and I will be short. We are greatly indebted to Dr. Donaldson Smith for the excellent manner in which he has done his work. He has not only gone far beyond his Italian predecessors as an explorer, but he has likewise laid down his route by careful astronomical observations. He has been among tribes, such as the Dume, Aro, and Konso, of whose existence we hitherto only knew from hearsay; and he has been among a people of pigmies, of which specimens only had hitherto been observed by European travellers. It is, however, to the question of the course of the Omo to which I wish to address myself to-night. The head-stream of that river, the Gibe, figures for the first time on the famous map of Fra Mauro, who makes it flow, as "River of the Gallas," to the Indian Ocean. More recently, from native information collected by M. d'Abbadie, Dr. Beke, and many others, the Omo was supposed to flow either to the Nile or to Lake Rudolf, Lake Stefanie, or Lake Abala, which is certainly distinct from Lake Abaya. Dr. Smith is inclined to believe that it is the upper Daua, but that river, at the highest point reached by M. Bottego, is comparatively a small stream, with sources apparently not far distant. I confess that, with the information at present in our possession, I am inclined to think that the Omo, after all, takes its course to Lake Rudolf. Going southward from Kafa, we are told, that that river has to be crossed, and that we then reach the country of the Dime and other tribes whom Dr. Smith has, for the first time, definitely located. Lake Rudolf covers an area of 4000 square miles; it lies almost wholly within a rainless

district, and the evaporation from its surface must be immense. This loss could never be made up if the Nianam were the only perennial river which enters the lake, and if its drainage basin were restricted to the area proposed. I may observe that neither Dr. Smith nor Count Teleki saw the Nianam at its best, for the rains in Kafa, where its sources lie, last from June or July to the beginning of November, and it is therefore during the latter month that the river would carry the greatest volume of water. This question of the course of the Omo is perhaps the most interesting problem to be solved in connection with African hydrography, and it would redound to the honour of America if Dr. Donaldson Smith went out again and settled it.

Dr. Donaldson Smith: I wish to thank the gentlemen who have spoken this evening for their very complimentary remarks, and all of you for the kind manner in which you have received me.

The Maps (1–5) which accompany this paper are reduced from Dr. Donaldson Smith's own drawings, adjusted to the 59 latitudes and 41 longitudes determined by him in the manner explained above by Mr. Coles. The meridian differences are dependent upon Gagap (Milmil) and Bari, as determined by Colonel Paget and Captain Swayne, and Lamu, taken from the Admiralty Chart.

The altitudes result from aneroid and boiling-point observations, the mean pressure at the sea-level being estimated from the charts of Dr. Buchan and Dr. Hann. They are, as a matter of course, merely approximations.

THE PAMIRS AND THE SOURCE OF THE OXUS.*

By the Right Hon. GEORGE N. CURZON, M.P.

PART III.

Before finally leaving the question of the Pamirs, there remains for me to redeem an earlier pledge by giving a list of the travellers of various nationalities who, from the commencement of the Christian era, are known to have visited or crossed that region. I will divide them into three classes: I. Pilgrims and travellers, Asiatic and European, down to the beginning of this century; II. English, Indian, and European explorers in the present century; III. Russian explorers in the same period.

I. The great Central or Seric route across Asia from Bactria to China was first discovered to Europe by the expedition of Alexander the Great. The first detailed description of it was supplied by a Macedonian trader, Maes Titianus, in an account of a journey made by the factors in his employ. From this information Marinus of Tyre (A.D. 150), the predecessor of Ptolemy, determined the route which was reproduced by the latter in his great work, and which, though the identification has long been a matter of dispute, in all probability passed across the northern

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* Paper read at the Royal Geographical Society, February 18, 1895. Map, p. 96.
Continued from p. 119.

or central Pamirs. In the early Middle Ages, when intercommunication became more frequent, the main line of connection, which was followed by European and Asiatic embassies, and was described by Arab geographers and historians, was transferred by Turkish and Tartar ascendency to the valleys of the Jaxartes (Syr Daria) and Narin. But a few bold travellers, voyaging to and from India, kept up the knowledge of the southern or Pamir route, and at intervals through the dark ages lifted the corners of the curtain that had settled so impenetrably down upon the heart of the Asiatic continent. Among these we possess the written records of several Chinese Buddhist pilgrims, who, in their ardour for the faith which their country had adopted, undertook long and perilous journeys from China to India, to search for the sacred scriptures and commentaries of the Buddhist Canon. Their journeys have, in the revival of geographical interest which distinguished the opening of the present century, been annotated and fought over by learned scholars. But not until more recent years has it been possible to apply the test of personal knowledge and local investigation to supplement or to correct the *a priori* disquisitions of the library. These are in many cases invalidated by such an inquiry, while the credibility of the original authors, subject to inevitable deductions for Oriental exaggeration, emerges on the whole with increased credit.

The first of these pilgrims whose record has been preserved was Shih Fa-hian, a native of Wu-yang, in Shansi, who in 399 A.D. started from his native province, in company with other priests, for a quest of the Scriptures in India. Upon his return, in 415 A.D., he wrote the 'Fo-kwo-ki,' an account of his travels.* Fa-hian's journey is easily traced as far as Khotan. From this point it is disputed whether its further progress to Northern India led him over or near to the Pamirs, or by a more easterly route. The following is the passage in the 'Fo-kwo-ki':†—

"From Khotan they pressed onwards to the Tseu-ho country. They were twenty-five days on the road, and then they arrived at this kingdom. . . . Having stopped there for fifteen days, they went south for four days, and entered the Tsung-ling (Onion) mountains. Arriving at Yu-hwui (or Yufai), they kept their religious rest; which being over, they journeyed on twenty-five days to the

* This was first translated into French from the Chinese and edited by Abel Rémusat, with commentaries by Klaproth and Landresse, under the title 'Foue-Koue-Ki ou Relation des Royaumes Bouddhiques' (Paris, 1836). It has been translated into English from the French by Laidlay; by the Rev. S. Beal, 'Travels of Fah Hian and Sung Yun' (London, 1869); and 'Buddhist Records of the Western World' (London, 1890), vol. i. p. xi. and xxiii.–lxxxiii.; and by J. Legge, 'A Record of Buddhistic Kingdoms' (Oxford, 1886). *Vide* also the introduction to General A. Cunningham's 'Ladak' (London, 1854); Sir H. Yule's 'Cathay and the Way Thither' (Hakluyt Society), 1866; Introduction to Wood's 'Oxus' (1872), p. xl.; and Major H. G. Raverty's 'Notes on Afghanistan' (1888), pp. 181, 298, 299.

† Beal's translation in 'Buddhist Records,' vol. i. p. xxvii.–xxx.

Kie-sha country. . . . This country is in the middle of the Tsung-ling mountains. From there, going onwards towards North India, after being a month on the road, we managed to cross Tsung-ling. In Tsung-ling there is snow both in winter and summer. Moreover, there are poison-dragons, who, when evil-purposed, spit poison, winds, rain, snow, drifting sand, and gravel-stones. Not one of ten thousand meeting these calamities escapes. The people of that land are also called Snowy-mountain men. Having crossed Tsung-ling, we arrive at North India. On entering the borders, there is a little country called Toli. . . . Keeping along Tsung-ling, they journeyed south-west for fifteen days. The road was difficult and broken, with steep crags and precipices in the way. The mountain-side is simply a stone wall, standing up 10,000 feet. Looking down, the sight is confused, and on going forward there is no sure foothold. Below is a river called Sintu-ho. In old days men bored through the rocks to make a way, and spread out side ladders, of which there are seven hundred in all to pass. Having passed the ladders, we proceed by a hanging rope-bridge, and cross the river. The two sides are something less than 80 paces apart. Crossing the river, we come to the country of Uchang, which commences North India."

Upon the identification of the line here sketched no two writers have agreed, while several have at different times adopted contradictory explanations. Klaproth identified Tseu-ho with the Chinese Chu-ku-po of Sung Yun and the modern Kugiar, in the district of Yangi-hissar, or Yarkand. Yu-hwui he supposed to be Ladak.

Beal, in his first edition, supposed Tseu-ho to be the Yarkand river; the Yu-whui country to be the Chiltung pass (Tangetar of Benedict Göes); Kie-sha to be the Kartchou or Kie-pan-to of Hwen Thsang, and the Han-pan-to of Sung Yun (*i.e.* Sarikol and Tashkurghan); and he added (p. 18), "It would appear that Fah Hian crossed the Tsung-ling mountains near the Great Pamir plateau, and then, instead of keeping along the Tengi Badakshan of Göes, he pursued a more southerly route towards Kitaur or Chitral." Having taken his traveller to "the headwaters of the Gilgit river" (p. 68), and having identified To-li with the Ta-li-lo of Hwen Thsang, Beal then identified this with Dhir, near the river Tal (p. 18). In the same edition, on p. 70, he identified the Sinto river with the Gilgit river, and on p. 21, with the Indus—a proof of the geographical confusion into which his reasoning had led him. Wu-chang, or Uchang, he accepted as Udyana. In his second edition, however, Beal finds Toli to be "the valley of Darail in the Dard country," while the Sinto has now become the Swat river (p. 15).

Cunningham, on the other hand, argued strongly for an entirely different and more easterly line, taking Fa-hian over the Karakoram mountains, and identifying Kie-sha with Ladak. He then conducted the pilgrim down the Indus valley to To-li, *i.e.* Darel, and so on to India. Yule accepted this line of reasoning, and denied that Fa-hian ever entered the Oxus basin at all.

Raverty, after asserting that "Fa-hian without doubt reached the present Kashgar territory, and traversed the Karakoram Pass," declared

his belief that Kie-sha was not Ladak, but the adjoining district of Balti, often called Little Tibet. To-li might, he thought, be Baltistan, Hunza, or Yasin (p. 298), though in another place he had identified the same name with the Tal or Panjkora river (p. 181). The Sinto he found to be the Gilgit river, and Uchang the Dangrak river or upper course of that stream, though elsewhere on the same page he seems to regard it as equivalent to the district of Swat. How, if Fa-hian crossed the Karakoram, he could have avoided Ladak, or how, if he passed through Baltistan to Gilgit, he could have passed Hunza, or why any of these identifications should be accepted, does not appear.

I do not agree with any of the last three writers, nor, in most particulars, with the first. It is to be observed that the pilgrims travelled slowly, whichever was the route that they adopted, and that their measurements, even if correct, which may be doubted, cannot be expected to correspond (any more than do Marco Polo's) with the distances of modern itineraries; that the Tsung-ling mountains is a name applied by the Chinese to the entire mountain mass, including the Pamirs, the Hindu-Kush, and the Mustagh range, as well as the mountain belt south of them extending from Badakshan on the west to Chinese Turkistan on the east; that Ladak, which is on the extreme eastern fringe, could scarcely be described as in "the middle of these mountains;" that Fa-hian's description of the Tsung-ling climate and conditions exactly accords with those of the Pamirs; that he employs the same name, "Snowy mountains," as is unmistakably applied by his successor Sung Yun to the main Hindu Kush range, south of Wakhan; and, that a month after leaving Kiesha he speaks of having *crossed* Tsung-ling, which he could only have done if coming from the north, and which he would nowhere be said to have done if coming from Ladak or Baltistan. It is further to be noted that the remaining Chinese pilgrims, of whose similar journeys the records have been preserved, all travelled, on their outward or return journey, by the Pamir line; and that there is no contemporary witness to a Karakoram route. I hold, therefore, that Fa-hian did traverse some portion of the Pamir region, though what track he followed, or by what passes he crossed the main range, we have no means of ascertaining. Proceeding from the north, it is not unnatural that he should strike the valley of Darel (which is probably his Toli, and the Ta-li-lo of Hwen Thsang) on the right bank of the Indus; while the latter must almost certainly be pronounced to be the Sinto of his narrative. This is the name that is elsewhere applied to the Indus by both Fa-hian and Sung Yun, and that is always given to it by Hwen Thsang, who in the 'Si-yu-ki' describes in almost identical language the same route as that taken by Fa-hian, only in the inverse direction:

"Going north-west (*i.e.* from Uchang) we re-ascend the Sintu river. The roads are craggy and steep; the mountains and the valleys are dark and gloomy. Sometimes we have to cross by ropes, sometimes by stretched iron chains. There are foot-bridges suspended in the air, and flying bridges across the chasms, with wooden

steps let into the ground for climbing the steep embankments. Going thus 1000 *li* or so, we reach the river valley of Ta-li-lo."*

It will be seen from this passage that Uchang must lie to the east of the Indus river, an inference which is also borne out by the narrative of Sung Yun.† I do not see, therefore, how Uchang or Udyana can be identified, as it has been by Yule and others,‡ with Swat, which is on the western side. Swat is apparently the Suhoto of Fa-hian, and the Swat river is the Su-po-fa-su-tu of Hwen Thsang (which is the Subhavastu of the Rig Veda and the Σοάαστος of Ptolemy).

There is less obscurity about the track of the next Buddhist pilgrims to India, of whose journey a record has been preserved. These were Sung Yun, a native of Tun-hwang, in Little Tibet, who was sent by the Empress of the Wei country from her capital Lo-yang (Hunan-fu) in 519 A.D., to search for sacred books in India—and his companion Hwui Sang. They returned in three years with 170 volumes of the Great Development Series, and their travels were preserved in the Chinese History of the Temples of Lo-yang.§ Sung Yun also journeyed by way of Khotan, after leaving which he thus described his movements:

"In the 2nd year of Shan Kwai, and the 7th month, 29th day, we entered the kingdom of Chu-ku-po. . . . The limits of this country can be traversed in about five days. During the first decade of the 8th month we entered the limits of the country of Han-pan-to, and, going west six days, we ascended the Tsung-ling mountains. Advancing yet three days to the west, we arrived at the city of Kineh-you (or Kong-yu), and after three days more, to the Puh-hoi mountains. This spot is extremely cold. The snow accumulates both by winter and summer. In the midst of the mountain is a lake, in which dwells a mischievous dragon. . . . From this spot westward the road is one continuous ascent of the most precipitous character; for 1000 li there are overhanging crags 10,000 fathoms high, towering up to the very heavens. . . . After entering the Tsung-ling mountains, step by step we crept upwards for four days, and then reached the highest part of the range. From this point as a centre, looking downwards, it seems just as though one was poised in mid-air. The kingdom of Han-pan-to stretches as far as the crest of these mountains. Men say that this is the middle point of heaven and earth. . . . To the eastward of the capital of this country there is a rapid river (or a river Mang-tsiu) flowing to the north-east towards Sha-leh. The highlands of the Tsung-ling mountains do not produce trees or shrubs. At this time, the 8th month, the air is very cold, and the north wind carries along with it the drifting snow for 1000 li. At last, in the middle decade of the 9th month, we entered the kingdom of Poh-ho. The mountains here are as lofty and the gorges deep as ever. . . . The land is extremely cold—so much so, that the people occupy the caves of the mountains as dwelling-places, and the driving wind and snow often compel men and beasts to herd together. To the south of this country are the Great Snowy mountains, which, in the morning and evening vapours, rise up like gem-spires."

* Beal's 'Buddhist Records,' vol. i. p. 133.

† Beal, Ibid., p. 102.

‡ Yule's 'Marco Polo,' vol. i. p. 173.

§ *Vide* Beal's two works as before; Yule's 'Cathay,' vol. ii. p. 542; and 'Introduction to Wood's Oxus,' p. xli.; Raverty, p. 299.

There has been a general agreement among commentators, although neither the name of the Pamirs nor any possible equivalent of it is mentioned, that Sung Yun's narrative describes a march across that region. There have, however, been different identifications of the various localities named. Yule identified Chu-ku-po with Yarkand, and Han-pan-to, the Kie-pan-to of Hwen Thsang (or Khavandha, according to the restoration by Stanislas Julien), with the Chinese district bordering on the Eastern Pamirs, and now known as Sarikol, whose chief town is Tashkurghan. He supposed Poh-ho to be Wakhan, but did not attempt to specify any particular passes or route, though he inclined to identify the latter with Marco Polo's track.* Beal followed Yule's interpretation, but identified Poh-ho with Bolor.† Raverty (pp. 181 and 299) said the Dragon Lake of the pilgrims was the Chatiboi lake (which, as I have before pointed out, in a footnote, is not a lake at all, but a glacier), at the source of the Yarkhun river,‡ and that the Great Snowy mountains were the main range of the Hindu Kush, including especially Tirach-mir.

For my own part, I believe that Sung Yun approached and crossed the Pamirs from the direction of Yarkand, though by what passes he travelled it would be mere guess-work to conjecture. The Dragon Lake, which appears from his identification to be in the middle of the Pamirs, and to lie to the north and north-east of Poh-ho (Wakhan), must be one of the Pamir lakes previously described, probably Lake Victoria—an identification which is the more likely if, as I shall show, this was the lake to which Hwen Thsang, 120 years later, gave the same name. The crest of the range, to which the pilgrim climbed with so much labour, appears to be one of the Pamir dividing-ridges, which, though of lower elevation than some of the Hindu Kush passes, seem to have uniformly impressed all the ancient travellers with a sense of superior altitude, and of being, so to speak, the apex of the world. Sung Yun's movements, after crossing the Hindu Kush, are more difficult to trace, and I will not here pursue them.

The most famous of all these pilgrims was, however, Hwen Thsang, a native of the province of Hunan, who in 629 A.D., in the reign of Tai Tsung, the second emperor of the Tang Dynasty, set out for India, upon his own initiative, with a similar object in view. He returned successful with twenty-two horse-loads of Buddhist literature in 645 A.D., and, at the command of the Emperor, then wrote or compiled from the Sanskrit books which he had brought back with him, the 'Si-yu-ki,' or

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* Yule's 'Marco Polo,' vol. i. p. 184.

† This could hardly be, since Sung Yun speaks a little later of Po-lu-lai, which is obviously Bolor.

‡ Another argument against this identification is the statement of Sung Yun, that from the lake westward the road is a continuous and precipitous ascent. I followed it, and it is a descent the whole way.

'Records of the Western World.' This work contains a narrative of his own experiences, as well as a mass of additional information upon the countries which he either visited or heard about; and was further supplemented by a life of the author, written by some of his pupils after his return, which corroborates and throws fresh light upon his travels.* With the outward journey of Hwen Thsang, which was by Tashkend, Samarkand, Balkh, and Bamian, I am not here concerned. It was on his homeward march, in the summer of 642 A.D., that, after passing through Badakshan, he came to the country of Tamositieti bordering on the Oxus, then to the country of Shang-mi, after which—

"On the north-east of the frontier of Shang-mi, skirting the mountains and crossing the valleys, advancing along a dangerous and precipitous road, after going 700 *li* † or so, we come to the valley of Po-mi-lo. It stretches 1000 *li* or so east and west, and 100 *li* or so from north to south; in the narrowest part it is not more than 10 *li*. It is situated among the Snowy mountains. On this account the climate is cold, and the winds blow constantly. The snow falls both in summer and spring-time. Night and day the wind rages violently. The soil is impregnated with salt, and covered with quantities of gravel and sand. The grain which is sown does not ripen; shrubs and trees are rare; there is but a succession of deserts without any inhabitants. In the middle of the valley is a great Dragon Lake; from east to west it is 300 *li* or so, from north to south 50 *li*. It is situated in the midst of the great Tsung-ling mountains, and in the central point of Jambudvipa. The land is very high. The water is pure and clear as a mirror; it cannot be fathomed. The colour of the lake is a dark blue, the taste of the water sweet and soft. In the water hide the *kau-ki* fish, dragons, crocodiles, tortoises. Floating on its surface are ducks, wild geese, cranes, and so on. Large eggs are found concealed in the wild desert wastes, or among the marshy shrubs, or on the sandy islets. To the west of the lake there is a large stream, which, going west, reaches so far as the eastern borders of Tamositieti, and there joins the river Fo-tsu (*i.e.* Oxus), and flows still to the west. So on this side of the lake all the streams flow westwards. On the east of the lake is a great stream which, flowing north-east, reaches to the western frontiers of the county of Kie-sha, and there joins the Si-to river and flows eastward; and so all streams on the left side of the lake flow eastward. Passing over a mountain to the south of the valley of Po-mi-lo, we find the country of Po-lo-lo. Here is found much gold and silver; the gold is red as fire. On leaving the midst of this valley and going south-east, along the route there are no

* The European literature upon Hwen Thsang is voluminous. I may instance Abel Remusat's translation of the 'Fo-koue-ki,' with notes by Klaproth and Landresse, Paris, 1836; Stanislas Julien's translation of his life, 'Histoire de la Vie de H. T.,' Paris, 1853; and of the 'Si-yu-ki,' 2 vols., Paris, 1857; Ritter's *Erdkunde*, vol. vii., Berlin, 1837; Major W. Anderson, *Jour. of As. Soc. of Bengal*, vol. xvi., 1847; Sir A. Cunningham, ibid., vol. xvii., 1848; V. de St. Martin, 'Mémoire Analytique sur la Carte de l'Asie Centrale et de l'Inde,' Paris, 1858; Sir H. Yule, 'Notes on H. T.'s Account of the Principalities of Tokharistan,' 1872; 'Cathay and the Way Thither,' vol. i. p. 184; *Jour. R.G.S.*, vol. xlii., 1872; and 'Introduction to Wood's Oxus,' p. xl.; Sir H. Rawlinson, *Jour. R.G.S.*, vol. xlii., 1872; J. B. Paquier, 'Le Pamir' (Paris, 1876), p. 34–45; Edkins, 'Notices of Buddhism in China;' and Rev. S. Beal, 'Life of H. T.,' London, 1888; and 'Si-yu-ki,' 2 vols., London, 1890.

† The *li* was a Chinese measure of distance, which varied somewhat at different times. Roughly speaking, however, we may reckon 5 *li* as the equivalent to one mile.

men nor villages. Ascending the mountains, traversing the side and precipices, encountering nothing but ice and snow, and thus going 500 *li*, we arrive at the kingdom of Kie-pan-to." *

With the narrative of the traveller himself may be compared the description of his biographers, who add a few more details. According to them the Dragon Lake is 200 *li* in length, and—

"The animals that dwell in it are of infinite variety; the noise of their ten thousand cries is like the tumult of a hundred workshops. We see here birds 10 feet or so in height; eggs as large as a round water-jar, probably the same as were formerly called the *ku-koh* of the Tiu-chi. . . . This lake, moreover, is one with the Anavatapta Lake, in its north and south direction." †

They further add that the great river on the east actually issued from the lake (which might be inferred from Hwen Thsang).

It is clear that there are in these two narratives many exaggerations, particularly of distance and dimensions. There are also serious inaccuracies, such as the easterly outflow from Victoria Lake (supposing this to be meant) or the westerly outflow from Chakmak Lake (supposing that to be intended).‡ Nevertheless, the salient features of the account stand out as an unmistakable picture of the Pamir country, as it has already been portrayed in this paper, and leave a doubt only as to the particular valley or Pamir by which the traveller crossed it. Klaproth, Landresse, St. Julien, St. Martin, Paquier, Beal concur in identifying this with Wood's route up the main valley of the Panja to Victoria Lake. Rawlinson in his earlier writings, and Yule, prefer the more southerly track to Lake Chakmak through the Little Pamir. I entertain very little doubt of the correctness of the former hypothesis. Reasons have before been given for supposing both that Victoria Lake may once have been much larger than it now is, while in any case it is more than double the size of Lake Chakmak, and that it was also the Dragon Lake of the earlier Buddhist pilgrim Sung Yun. The stream flowing out on the west is, of course, the Famir river, or middle confluent of the Panja. Neither the eastward-flowing drainage from the watershed beyond the eastern extremity of Victoria Lake, nor the Aksu issuing from Lake Chakmak, flow, as Hwen Thsang imagined, into the basin of the Yarkand river; but this was an error which the learned Chinaman committed in company with later and better-equipped travellers. That Victoria, and not Chakmak,

* Beal, 'Buddhist Records,' vol. ii. pp. 297, 298.

† Beal, 'Life of H. T.,' pp. 197, 198.

‡ Sir H. Rawlinson, in the later part of his life, wrote an essay (*Proc. R.G.S.*, 1887, p. 69), in which he argued, mainly from Mr. Ney Elias' report of his visit to Rang Kul, that the latter was the Dragon Lake of Sung Yun and Hwen Thsang. I do not think this can possibly have been the case, since Rang Kul is neither situated in the middle nor in the highest portion of the Pamirs. Above all, it has no river exit on either side, and no river anywhere near to its eastern extremity, much less flowing out of it.

Lake is alluded to is further demonstrated by the direction, viz. south-east, taken by the pilgrim, after passing the lake on his way to Kie-pan-to (assuming the latter, with Yule, to be Sarikol with its capital Tashkurghan). If he had been marching by the Little Pamir route, he would have had to proceed north-east from Chakmak to Aktash. Po-lo-lo is the mysterious country so often designated Bolor.* By some critics its very existence, as a geographical reality, has been denied. Cunningham erroneously narrowed its identification to Baltistan or Little Tibet. I have not space here to argue the question,† but it can, I think, be demonstrated that Bolor, or Bilaur, was the name applied throughout the Middle Ages to the elongated belt of mountain country south of the main range of the Hindu Kush, including the valleys of Kafiristan, Upper Chitral, Yasin, Gilgit, and Hunza-Nagar (and in the pages of some writers having an even wider application). The reference to the existence of gold in this region is a further instance of accuracy. The dust is still procured by washing from the streams.

After the passage of the last of the recorded Buddhist pilgrims, there is a hiatus of six centuries in our acquaintance with Pamir topography. At the end of this time we encounter the ubiquitous footstep and the marvellously reliable pen of the great Venetian. It was in about the year 1274 A.D. that Marco Polo, his father Nicolo, and his uncle Maffeo, on their journey to the court of Kublai Khan, passed through Badakshan and then, in Marco's words—

"At the end of twelve days you come to a province of no great size, extending, indeed, no more than three days' journey in any direction, and this is called Vokhan.‡ . . . And when you leave this little country, and ride three days north-east, always among mountains, you get to such a height that it is said to be the highest place in the world. And when you have got to this height you find [a great lake between two mountains, and out of it§] a fine river running through a plain clothed with the finest pasture in the world; in so much that a lean beast there will fatten to your heart's content in ten days. There are great numbers of all kinds of wild beasts; among others, wild sheep of great size, whose horns are good 6 palms in length. . . . The plain is called Pamier, and you ride across it for twelve days together, finding nothing but a desert, without habitations or any green thing, so that travellers are obliged to carry with them whatever they have need of. The region is so lofty and cold that you do not even see any birds flying, and I must notice also that because of this great cold, fire does not burn so brightly, nor give out so much heat as usual, nor does it cook food so effectually. Now, if we

* *Vide* Hwen Thsang's account of it in another part of his work. Beal's 'Buddhist Records,' vol. i. p. 135.

† It is discussed in Elphinstone's 'Caubul,' vol. i. p. 118; Sir H. Yule, *Jour. R.G.S.*, vol. xlii. (1872), p. 473, 'Marco Polo,' vol. i. pp. 187, 188, 'Introduction to Wood's Oxus,' p. lv.; R. B. Shaw, *Jour. R.G.S.*, vol. xlvi. (1876), p. 292; Sir A. Cunningham, 'Ancient Geography of India,' p. 84; S. Beal, 'Buddhist Records,' vol. i. p. 135. But by far the most learned and authoritative dissertation is that of Raverty, 'Notes on Afghanistan,' pp. 295–308.

‡ *i.e.* Wakhan.

§ The words between brackets are found in Ramusio's Italian edition.

go on with our journey towards the east-north-east, we travel a good forty days, continually passing over mountains and hills, or through valleys, and crossing many rivers and tracts of wilderness, and in all this way you find neither habitation of man, nor any green thing, but must carry with you whatever you require. The country is called Bolor." *

Here again the main question to be determined is the identity of the lake, and as a necessary consequence of the route, indicated by the traveller. Pauthier, Rawlinson, and the majority of critics suppose the former to be Lake Victoria, and the latter the line followed in 1838 by Wood. Yule seems to have hovered between two opinions, for whereas in the text of his second edition of Marco Polo (1875) he says, "There is nothing absolutely to decide whether Marco's route from Wakhan lay by Wood's Lake or by the more southerly source of the Oxus in Pamir Kul," in his map appended thereto he marks the track along the shores of Victoria Lake; while three years earlier he had in two independent writings † expressed the opposite opinion, and pronounced for Lake Chakmak. Paquier alone (as far as I know) has argued in favour of a third hypothesis, viz. that Polo went by neither lake, but ascended the valley of the Shakh-dara, and somehow or other crossed the Pamirs in their centre. His argument appears to me quite unintelligible, and is in almost every point at variance with the results of recent exploration.‡

I have at different moments been favourably inclined towards both the Victoria Lake and the Chakmak identification, and I cannot even now feel positive certainty in deciding between the two. On the whole, however, I incline to the former, or Great Pamir route. Polo evidently assumes a smaller Wakhan than the territory at present bearing that title, which begins in the bend of the Oxus at Ishkashim and extends to Sarhad, a distance of about 120 miles. Seemingly, he only extends it as far as Kala Panja, about half that distance. The three days' ride north-east will then be the journey up the valley of the Pamir confluent of the Panja from Langar Kisht to Victoria Lake, upon which Wood, both in coming and returning, spent four days in the dead of winter. The Venetian's lake is then Victoria Lake, and the river the Pamir river.§ This also may be said for this hypothesis, that although the actual elevation of Lake Victoria is only some 300 feet higher than that of Lake Chakmak, yet its situation and surroundings supply a greater excuse for the illusion that it was the highest place in the world. The twelve days' ride across the Pamir can hardly be employed

* Yule's 'Marco Polo,' vol. i. p. 180.

† *Jour. R.G.S.*, vol. xlii. (1872), p. 475, and 'Introduction to Wood's Oxus,' p. lxxiv.

‡ 'Le Pamir,' pp. 48–62.

§ Conversely, it is possible to argue that the three days among the mountains describe the march from Sarhad to Lake Chakmak, that the river flowing from the lake is the Aksu, and that the Pamir is the Little Pamir. But in this case the error about Wakhan attains inexplicable dimensions, and the fertility of the Little Pamir seems inordinately exaggerated.

as an argument for one hypothesis or the other, since we have no clue as to where Polo conceived the Pamir to begin or to end. The reference to the *Ovis Poli* in the passage above quoted (from which it received its modern name) is obvious. As regards Beloro or Bolor, Marco Polo apparently protracts the area ordinarily so described to the north of the Hindu Kush, and brings it round in a great north-easterly sweep at least as far as Sarikol, if not to the borders of Kashgar territory.

Another three hundred years elapsed before we have any further record of a Trans-Pamir journey, and on this occasion, with an unconscious reciprocity that is one of the romances of history, India turned the tables upon Far Kathay, which a thousand years before had despatched its agents and pilgrims to study at Indian shrines, by herself sending out the evangelist of a newer though non-Indian faith, to reconnoitre for possible action the ground of her former conquest.

Benedict Goez, a lay Jesuit, who, though born in the Azores, had passed in the service of Portugal to India, and had there joined the mission of Jerome Xavier to the court of the great Akbar at Agra, was despatched from that place by the Provincial of his Order, with the consent of the emperor, at the begining of 1603 A.D., upon an expedition of missionary inquiry to the fabled kingdom of Cathay (Khitai). Travelling by Lahore, Peshawur, and Kabul, in the disguise of an Armenian, and in the company of a *kafila* of merchants, he crossed the Hindu Kush into Badakshan, and, passing through the Teng-i-Badakshan—one of the mountain defiles leading into the Oxus valley—came to Ciarciunar (Char Chenar?).

"From this in ten days they reached Serpanil (Sir-i-Pamir?). But this was a place utterly desolate and without a sign of human occupation; and then they came to the ascent of the steep mountain called Sacrithma.* None but the stoutest of the horses could face this mountain; the rest had to pass by a roundabout but easier road. . . . And so, after a journey of twenty days, they reached the province of Sarcil (Sarikol), where they formed a number of hamlets near together.† . . . Then in two days more they reached the foot of the mountain called Ciecialith (*i.e.* the Chichiklik pass). It was covered deep with snow, and during the ascent many were frozen to death, and our brother himself barely escaped, for they were altogether six days in the snow here. At last they reached Tanghetar (now Tangitar), a place belonging to the kingdom of Cascar (Kashgar). . . . In fifteen days more they reached the town of Jakonich (Yakir-i-Kurghan?). . . . After five days more our Benedict reached the capital, which is called Hiarchan (Yarkand)."‡

* I cannot suggest an identification for this name, unless it be the Sarikoram pass, by which it is conceivable that Goez, if he travelled, as I think, by the Ab-i-Panja and Little Pamir route, may have crossed from the Aksu valley on to the Taghdumbash Pamir. Yule, on the other hand, identified his route with Wood's.

† Probably at or near to Tashkurghan.

‡ Yule's translation of a work by Trigault, based upon Ricci's annotation of Benedict Goez' notebook, entitled 'De Christiana Expeditione apud Sinas' ('Cathay and the Way Thither' (Hakluyt Society), vol. ii. pp. 529–562). Compare 'Introduction to Wood's Oxus,' p. xliv.; and Paquier, 'Le Pamir,' pp. 65–67.

The above narrative, the successive stages of which cannot, I think, be mistaken, is further supplemented by some fragments of letters from Goez—who died in China—which were preserved by the Jesuit Jarric in a collection or *thesaurus* published in 1615. In one of these, dated from Yarkand, Goez spoke of the great difficulties and fatigues encountered in crossing the desert of Pamech (Pamir), the cold of which was so great that animals could scarcely breathe the air, and often died in consequence. As an antidote to this, he said that the men used to eat garlic, leeks, and dried apples, and the horses' gums were rubbed with garlic. This desert took forty days to cross—the same as Marco Polo's measurement—if the snow was extensive.

II. Nearly two and a half centuries elapsed before we meet with the next record of a journey to or across the Pamirs. This was the famous expedition of Lieut. (afterwards Captain) John Wood, of the Indian Navy, whose name fitly inaugurates the long list of British, Indian, and European explorers who, in the fifty years that have passed since his day, have familiarized us with that which was then an impenetrable mystery, not as yet irradiated by the translated records, save that of Marco Polo's journey, to which I have already, in chronological order, referred. Sent on a mission with Dr. Lord by Burnes from Kabul to Murad Ali, the Beg of Kunduz, in November, 1837, Wood proceeded from the latter place *viâ* Khanabad, Talikhan, Faizabad, Jerm, and Zebak, till at Ishkashim he touched the stream of the Oxus on February 4, 1838. Ascending the river to Kala Panja, he followed its northern confluent, the Pamir river, to its source in Victoria Lake, which he reached on February 19. His discoveries and his book reawakened public curiosity in a subject which had almost faded out of human interest, and have provided the background for the whole of our subsequent knowledge. Nor is their value in any appreciable degree impaired by the fact that the true source of the Oxus has since been found to lie elsewhere, or that Wood's scheme of the hydrography of the Pamirs was in almost every respect erroneous.* As the pioneer of modern exploration in these interesting regions, his name will always be held in honour. His route, as I have already argued, was in all probability identical with that which had been taken by the Chinese pilgrims Sung Yun and Hwui Sang 1300 years, by Hwen Thsang 1200 years, and by Marco Polo, 550 years, earlier.

Next upon the scene appear a number of native emissaries of the

* He wrote (p. 233): "The hills and mountains that encircle Sir-i-kol give rise to some of the principal rivers of Asia. From the ridge at its eastern end flows a branch of the Yarkand river, one of the largest streams that waters China; while from the low hills on the northern side rises the Sirr, or river of Kokan, and from the snowy chain opposite both forks of the Oxus, as well as a branch of the river Kuner, are supplied." These propositions are uniformly incorrect. The mountains encircling Victoria Lake give rise to no drainage save that of the Oxus and its main confluent the Aksu.

Indian Government, who, owing to the difficulty or impossibility of exploration by British officers in regions so habitually disturbed or lying so far outside the then borders of the Indian dominions, were despatched on missions of a diplomatic or scientific character in the neighbourhood of the Pamirs. Of these, the first was Abdul Mejid, a *mulla*, who was sent in 1860 with a letter and presents to Mulla Khan, ruler of Kokand.* Starting from Peshawur, he proceeded *viâ* Kabul and Khanabad, in Kunduz, following upon Wood's footsteps to the Oxus valley in Wakhan. At Langar Kisht he commenced the ascent of the Pamir river towards Victoria Lake, but at Yangalik (called also Yumkhana) he diverged from Wood's track, and made the first recorded passage of the Pamirs from south to north, *viâ* Khurgoshee (Khargosh Kul), Sussugh Kol (Sasik Kul), Chadur Tash (Chatir Tash), Kurra Soo (Kara Su), Moorghabee (the site of the Russian post), and Ak Baital to Kurrah Kol (Great Kara Kul), whence he proceeded by the Kizzil Arut (Kizil-art) Pass to the Alai. It was in these words that he described his crossing of the Pamirs:

"From Lungur Wakhan, fourteen weary days were occupied in crossing the steppe. The marches were long, depending on uncertain supplies of grain and water, which sometimes wholly failed. Food for man and beast had to be carried with the party, for not a trace of human habitation is to be met within these inhospitable wilds."

Of about the same date is the itinerary of a journey from Chitral and Mastuj *viâ* the Baroghil Pass, Sarhad, Langar (identical with the route which I followed in the inverse direction), Chakmak Lake, and the Little Pamir to Aktash, and thence across the Neza-tash pass to Tashkurghan — which was compiled by Mohammed Amin, a Yarkandi merchant, who acted as guide to the murdered Adolph Schlagintweit, and subsequently gave the itinerary to the unfortunate Hayward, who experienced a similar fate. The report, though brief, is singularly accurate, and was published by the Indian Government in 1862.† A second, but more obscure itinerary, furnished by him to Pundit Manphul, a Hindu in the service of the Punjab Government, is contained in the same collection.‡ From Jangalik, on the Pamir river, it proceeds *viâ* Hamdamin and Kotal-i-Aghajan (which I cannot identify) to the valley of Tashkurghan.

It was in the same decade that the Survey Department of the Government of India began to despatch in many directions beyond the northern barriers of the Himalayas and the Hindu Kush those nameless explorers who, often under obscure generic titles, or beneath the disguise of their

* His itinerary was published in 'Selection from the Records of the Government of India, Foreign Department, No. xxxix. Calcutta, 1863.' *Vide* also Davies' Report, Appendix XX. C.

† *Vide* Davies' 'Report on the Trade Routes of the North-West Frontier,' Appendix IV. B. Compare *Jour. R.G.S.*, vol. xlii., 1872, pp. 440–448.

‡ Appendix XXXI.

initials alone, have added so much to our geographical knowledge of the trans-frontier regions. One of these, known as the Mirza, started from Kabul in October, 1868, with instructions from Major T. G. Montgomerie, Deputy Superintendent of the Great Trigonometrical Survey, to penetrate to the upper Oxus, and to cross the Pamirs from west to east on his way to Kashgar.* Reaching the Oxus valley by way of Bamian, Khulm Tashkurghan, the Kokcha river, and Ishkashim, he ascended the river to Kala Panja, from whence, instead of diverging, as his immediate predecessors had done, up the Pamir river to Lake Victoria, he continued his exploration of the main valley of the Oxus, until he arrived, in January, 1869, at Lake Chakmak, which he designated Pamir Kul. Here all the streams were frozen, and the entire ground was under snow—a condition which led the Mirza into the mistake of supposing that the little confluent which I have described as flowing into the Ab-i-Panja at Bozai Gumbaz, actually issued from the west end of the lake. The Mirza appears also to have thought that the Aksu, instead of flowing north-west from Aktash, pierced the Neza-tash range, and flowed into the Sirikol or Tashkurghan basin, across which he himself pursued his path to Yangi Hissar to Kashgar.

The former of these errors was rectified by Ibrahim Khan, an assistant in the same government department, who, in the summer of 1870, approached the Pamirs from the opposite quarter, being sent by Forsyth from Kashmir, in anticipation of the contemplated journey of the unhappy Hayward. Proceeding *viâ* Gilgit and Yasin, he crossed the Darkot and Baroghil passes to Sarhad; and from thence made his way, by the route which I have previously described in the inverse direction, to Langar, Bozai Gumbaz, and Lake Chakmak (which he denominated Kalsar Bam-i-Dunya), where he reported the Aksu as flowing out on the east, but no outlet as existing on the west. Thence he proceeded *viâ* Tashkurghan and Yangi Hissar to Yarkand.†

In the same year a more northerly track across the Pamirs was pursued by Faiz Baksh, a native who was employed by Sir D. Forsyth to travel *viâ* Badakshan and the Pamirs to meet him at Yarkand on the occasion of his first mission to Yakub Beg, the Atalik Ghazi of Kashgar. Marching from Kabul by the familiar route (Bamian, Balkh, Kunduz, Faizabad, Zebak, Ishkashim) to the Oxus valley, he ascended *viâ* Kala Panja and Langar Kisht to Jangalik. Thence the stages of his journey, as given by himself, were Dasht-i-Khar-gachi (Khargoshi?), Yolmazar, Dasht-i-Khargoshi, Mazar-tepe, Bash Gumbaz Pass, Dasht-i-Kol Hauz Kalan, Buztere, Istik, Aktash, Shindi, Tashkurghan.‡ It is evident

* *Vide* report of his explorations in *Jour. R.G.S.*, vol. xli. 1871, pp. 139–913. Compare Yule's 'Introduction to Wood's Oxus,' pp. xlvii., lxxiii., and 217; Paquier, pp. 113–116.

† *Proc. of the R.G.S.*, vol. xv., 1870–71, p. 387.

‡ *Jour. R.G.S.*, vol. xlii., 1872, pp. 464–466; Yule's 'Introduction to Wood's Oxus,' p. l.

from this description that the traveller confused two entirely distinct itineraries. Had he gone by the route indicated in the earlier names, his Kol Hauz Kalan (*i.e.* Lake of the Big Pool) might have been Sasik Kul, which, from its petty dimensions, could not conceivably have been so called. The later names, showing that he proceeded *viâ* Istik to Aktash, leave it clear that he transferred to his itinerary stages which he never actually traversed, but which lay to the north of his route, and that in reality he proceeded by Lake Victoria (which is his Lake of the Big Pool) and the oft-trodden route to Aktash and Tashkurghan. This confusion does not appear hitherto to have ever attracted attention.

In the same year (1870) I have found the traces of a similar journey across the Pamirs, starting from Kabul, and proceeding *viâ* Kunduz, Badakshan, and Wakhan to Yangi Hissar and Kashgar, of a Greek named Dr. Potagos, whose travels were translated into French and published fifteen years later.*

Next in chronological order comes the first really scientific expedition to the Pamirs undertaken by British agents, viz. the journeys of Captain (now Colonel) Trotter, Lieut. (now Sir Thomas) Gordon, Captain (now Colonel) J. Biddulph, and Dr. Stolicza, who were detached from Sir D. Forsyth's second mission to Kashgar in 1874, to make a detailed exploration of what was still at that time universally designated the Pamir Plateau. The records, in the shape of reports, books, and papers, that were left by the various members of this expedition have been cited in the opening portion of this essay, and constituted the first serious British contribution to the scientific knowledge of the entire region. Marching *viâ* Sarikol and Tashkurghan, they reached Lake Chakmak on April 5, 1874, finally setting at rest the disputed questions as to the river outlet or outlets from that lake. Thence Gordon, Trotter, and Stolicza went north to Lake Victoria and the Istik river, while Biddulph marched southwards by Sarhad to examine the Baroghil Pass, and ultimately returned *viâ* Lake Chakmak to rejoin his companions. Meanwhile Trotter had despatched Abdul Subhan, a native assistant surveyor, to investigate the course of the Oxus through Shighnan and Roshan; to whose report upon the respective volumes of the Panja and the Bartang (Murghab) at Kala Wamar I have previously referred.

A different route was taken, at the expense of a fresh geographical error, by a native *employé* of the Indian Survey Department, in 1880. This was one M. S., a Pir, who ascended the Bartang valley from Kala Wamar, in September of that year, as far as Sarez, where, from some inexplicable error, he reported that the source of that river lay, thereby throwing once again into confusion the as then unsolved question of the three-in-one Aksu-Murghab-Bartang.†

* Dr. Potagos, 'Dix Années de voyages dans l'Asie Centrale,' etc. Traduction: Paris, 1885.

† Report of the Indian Survey Department, 1881–82.

In 1885, Mr. Ney Elias, already famous for his Asiatic travels, was despatched by the Indian Government upon a special mission to Chinese Turkistan, included in his orders being an instruction to explore and report upon the Afghan districts of the upper Oxus. With characteristic intrepidity, he sketched out for himself and followed an entirely original track from east to west across the Pamirs, with the results of which the public has only been made familiar by hearsay. Starting from Kashgar in September, 1885, he proceeded by Little Kara Kul and Rang Kul (being the first Englishman to visit those lakes) to the Alichur river and Yeshil Kul, whence he descended the Ghund valley to Kala Bar Panja, on the Oxus. Following that river northwards to Kala Wamar and the boundaries of Darwaz, he then struck eastwards up the Bartang basin to the base of the Kudara valley. Returning thence, he ascended the left bank of the Oxus to Ishkashim, whence, *viâ* Zebak and Badakshan, he proceeded westwards through Afghan Turkistan to join the Anglo-Russian Boundary Commissioners, whom he encountered near Herat, in January, 1886. His journey, though inaccessible in its published form to the public, added greatly to the geographical and political knowledge in possession of the Indian Government, and has contributed substantial additions to all subsequent maps.

In the following year, *i.e.* 1886, Colonel (now Sir W.) Lockhart, Colonel Woodthorpe, Captain Barrow, and Dr. Giles, who had occupied the year 1885 in their interesting mission to the court of Aman-ul-Mulk, Mehtar of Chitral, and had explored the southern slopes and valleys of the Hindu Kush, returned to the same destination by a circuitous march from Gilgit (for the most part over the track which I followed and have described) *viâ* Hunza-Nagar, the Kilik, the Wakh-jir Pass, the Oxus valley, Kala Panja, and Wakhan. Theirs was the first scientific report of the main course of that river from its glacier source (which, however, they did not visit, but which was mapped by a native surveyor) to the great bend at Ishkashim. It is enshrined in a monumental government publication.

In the spring of 1887, the three French travellers, MM. Bonvalot, Capus, and Pepin, already well known for their travels and writings in other but less remote parts of Central Asia, made the first recorded passage of the Pamirs from north to south, *i.e.* from Russian territory in Ferghana, to British Indian territory in Chitral. Descending into the Alai valley by the Taldik pass, they crossed the Kizil-art on to the Great Kara Kul, whence by the Uzbel Pass they proceeded to Rang Kul, and by the Kara-su and Aksu valleys to Aktash, Lake Chakmak, and the Little Pamir. Continuing to Bozai Gumbaz and Sarhad, after an unsuccessful attempt upon the Irshad pass, they crossed the Baroghil and descended the Yarkhun river to Mastuj, whence they were rescued in an almost destitute condition by the kindly offices of Lord Dufferin, at that time Viceroy of India, and safely escorted t

Simla. Their books, which do not err on the side of generosity, have been already alluded to.

From this time onward, attracted by the increasing notoriety, or impelled by the political fascination, of the region, the stream of English explorers in the Pamirs swell rapidly. In the summer of 1888, St. George Littledale, a subsequent Gold Medallist of this Society, paid his first visit to the Pamirs, in pursuit of *Ovis Poli*, penetrating, under Russian patronage, from the north as far as the Great Kara Kul. In 1889 he undertook, with Mrs. Littledale (the first, and so far the last, English lady who ever saw the Pamirs), a more adventurous journey, crossing the region from north to south, and passing *viâ* Kara Kul, Victoria Lake, Lake Chakmak, Sarhad, the Baroghil and Darkot passes to Kashmir. At Kara Kul, in 1888, he encountered Messrs. O'Connor, H. Ridgway (Americans), and H. Dauvergne (a French merchant, long resident in Kashmir), who, entering from the same quarter, were making a tour of the Central Pamirs. In 1889, in the same neighbourhood he met Major Cumberland, who had separated from Captain Bower and H. Dauvergne on the Taghdumbash Pamir, at the same time that Dauvergne had started on his return to Gilgitby the Wakhjir Pass, the sources of the Oxus, the Baroghil, the sources of the Yakhun and Karumba rivers, and the Ishkumman gorge. In the same year, *i.e.* 1889, two other Frenchmen, Visconte de Breteuil and L. Richard, were engaged on a sporting expedition with H. Ridgway on the southern Pamirs.

It was at about the same time that Captain F. E. Younghusband, like Bower, a Gold Medallist of the Society, commenced those explorations of a semi-political, semi-geographical character in the Pamir region which extended over three years, and were diversified by the opposite features at one time of the peaceful reading of a paper before the Royal Geographical Society, at another of his own forcible arrest and expulsion from Bozai Gumbaz by Colonel Yonoff and his predatory band. This was on August 17, 1891, Lieut. Davison (since dead) being simultaneously arrested and deported from the Alichur Pamir, whither he had been despatched on a reconnoitring mission by Younghusband. In 1890 the latter had traversed the central Pamirs with Mr. H. Macartney, the British representative at Kashgar; in 1889 he had broken ground on the Taghdumbash.

I now pass to more recent visitors, the majority of whom have been attracted to the Pamirs by the love of sport, or, in other words, the pursuit of *Ovis Poli*, though to these preoccupations some of their number have added the quest of geographical or scientific knowledge. In 1891 H. Lennard and R. Beech, and separately from them Lieut. J. M. Stewart, were on the southern Pamirs. In 1892 Lord Dunmore and Major Roche, as described in the former's book, crossed the Pamirs from south-east to north-east, entering from Yarkand and emerging at Kashgar. In 1893 a Frenchman, Baron de Ponçins, marched from north

to south, and came down into India. In 1894, which was the year of the journey undertaken by Lennard and myself, which I have here described, Comte de Bylandt, a Dutchman, also crossed from north to south. In 1894–5 Dr. Sven Hedin, the well-known Swedish traveller and scientist, from the base of Pamirski Poste, or the Russian fort at Murghabi, conducted these explorations of Mustagh Ata to which reference has before been made. Other sportsmen, coming from Yarkand and Tashkurghan, have shot *Ovis Poli* on the Taghdumbash Pamir, but, having penetrated no further into the true Pamir country, cannot be counted here. Finally, in the summer and early autumn of 1895, Major-General Gerard, Colonel Holdich, and Captain McSwiney, representing Great Britain on the Pamir Boundary Commission, which was appointed to demarcate the frontier between Lake Victoria and the Chinese border above the Taghdumbash, completed our scientific knowledge, and rectified the cartography of the southern Pamirs, in conjunction with Major-General P. Shveikovski, the chief Russian representative, and M. Benderski, of earlier topographical fame. These are, so far as I know, the only English and European (other than Russian) travellers who have been either tempted by pleasure or impelled by duty to a peregrination of the inhospitable "Roof of the World."

III. Finally, I turn to the Russian explorers, who, though appearing on the field much later than their British or Anglo-Indian rivals, have yet during the last twenty years, owing to the superior proximity of their base, and to the consistent patronage of the Imperial Government, made a more thorough and detailed survey of the northern and central Pamirs, with occasional rushes and excursions to the southern or more British zone, than British officers have ever been able to do of the regions lying beyond the recognized frontier of Hindostan. In the majority of places the Russians have not been the first in point of time to arrive; but, having arrived, they have commonly effected more.

It was as the sequel to her rapid and all but unresisted conquest of the Central Asian Khanates in the decade following 1860, that the pioneers of Russia, pushing their way eastwards through the province of Ferghana, first struck the Pamir region from the north. Fedchenko, in 1871, made his way to the Alai valley, but did not cross the Trans-Alai mountains, though he named their highest peak, in honour of the Russian Commander-in-chief, Mount Kaufmann. He did not, however, touch the Pamirs proper, which were reserved for his successors.

In 1876 the famous Skobeleff was placed by Kaufmann in command of the Alai expeditionary force, with instructions to explore and plant the Russian flag in these little-known outskirts of the new Russian dominion. The party consisted of Captain Kostenko as geographer and statistician, A. Bonsdorf as geodesist, W. Oshanin for natural history, Colonel Lebedeff of the Corps of Topographers, and others. Starting from Gulcha, the then Russian outpost, in August, 1876, the main body

of the force, under Skobeleff, did not proceed beyond the Alai valley, but from their camp there Prince Witgenstein, having been sent on with a flying column across the Trans-Alai, was the first European in modern times to see the Great Kara Kul, which he reached on August 12. Thither he was speedily followed by Kostenko, who then started for Rang Kul, but, owing to lack of provisions, did not get beyond the Uzbel Pass, from the summit of which he saw the great peak of Mustagh Ata on August 19. Meanwhile Witgenstein, marching due south from Kara Kul, had proceeded as far as the Tuyuk or Ak Baital Pass. This was the limit of Russian exploration in that year.

In the following year the first really qualified scientific expedition was despatched by General Kaufmann, its operations extending into two years. The control of the party was given to N. Severtsoff, with particular charge of physical geography and zoology; Schwarz undertook the astronomical and magnetic observations; Skassy was topographer; Colonel Kushakevich was botanist and entomologist; and Captain Skorniakoff was in command of the escort. Leaving Tashkend in September, and Osh in October, 1877, they crossed the Alai by the Shartdawan, and the Trans-Alai by the Kizil-art, and explored the region between the mountains and Kara Kul. In 1878 they reassembled near that lake, being joined there by Rudonef, and then marched south by the Tuyuk pass to Rang Kul, whence they descried the two great mountain masses towering up to the east beyond Little Kara Kul, the northernmost of which had been roughly fixed by Hayward on his road from Yangi Hissar to Kashgar in 1868, and by Trotter from the same neighbourhood in 1874; while the southerly peak had been seen by Kostenko from the Uzbel in 1876, and by Trotter and Gordon from Tashkurghan in 1874. The second of these, as has before been pointed out, is the true Mustagh Ata. From Rang Kul the party turned southwestwards, and explored the Sarez and Alichur Pamirs, visited Yeshil Kul, discovered the small cluster of lakes at its eastern extremity, and for the first time connected the Russian with the British surveys, four years earlier, of Trotter. Scarcity of provisions again compelled an early return, and in September the expedition was back at Gulcha. Severtsoff gave it as his opinion that in the inner Pamirs the elevation, which he computed to have risen 600 feet in the last 12000 years, is still going on.*

Meanwhile, in 1878 two other Russian expeditions had, from different quarters, assailed the same objective. Crossing the Trans-Alai range by the Ters-agar pass, to the west of Mount Kaufmann, J. Mushketoff descended upon the valley of the Muk-su, or southern confluent of the Kizil-su, but was prevented from penetrating further southward by

* Vide *Isvestia Imp. Russ. Geogr. Obsh.* (St. Petersburg), 1879; *Zapiski* of Ditto, vol. xiii., 1886, and vol. xv., 1887; and Severtsoff's posthumous work, in Russian, entitled 'Orographical Sketch of the Pamir Mountain System.'

the rebellion that had broken out in Shighnan and Darwaz after the death of the Atalik Ghazi, Yakub Beg. Turning eastwards, he visited Kara Kul, and returned from thence to the Alai. His geological observations showed the northern part of the Pamir region to consist of granite, metamorphic clay, and mica slate, overlaid with strata of the trias formations, the direction of the granite upheavals being north-east.

In the same summer another party, consisting of Oshanin, Nevelski (botanist), and Rodionoff (surveyor), projected a crossing of the entire Pamirs from north-west to south *viâ* Poliz and the Sel-sai; but were stopped by difficulties and accidents, and compelled to return in September to Altyn Mazar, having only surveyed what may be called the northern boundary of the region.

When, in 1878, General Abramoff was placed in command of the military expedition which was despatched by Kaufmann in that year, simultaneously with the Kabul mission, to execute an anti-English diversion in the Pamirs, Matvaieff, the military topographer attached to the party, is said to have surveyed the western confines of the Pamirs, and to have crossed the Oxus into Badakshan. Whether he penetrated the Pamirs strictly so called, I have been unable to ascertain. The names of Dr. Regel, botanist, and Kossiakoff, military topographer, who in 1881 entered Darwaz from Karategin, and in 1882 wintered in Shighnan, should not be altogether omitted in this context, although their labours were directed rather to the Pamir borderlands than to the Pamir itself.

We next come to the second great official Russian expedition, which was commissioned in 1883 to complete the labours of Severtsoff and his earlier band of pioneers. Its members were Captain Putiata of the general staff, Ivanoff as geologist, and Benderski as topographer. Leaving Tashkend in May, and Osh in June, 1883, they marched to Kara Kul, whence Putiata and Benderski proceeded *viâ* Bulun Kul, Little Kara Kul, and the Tagharma valley to Tashkurghan, and from there by the Neza-tash pass down the Aksu to Ak-baital; while Ivanoff's route lay *viâ* Rang Kul, Little Kara Kul (whence he examined Mustagh Ata), and the Aksu to the same destination. Again separating, Putiata went *viâ* Buz-tere to the Alichur, and Yeshil Kul, and then made a circuit by the Koh-i-tezek pass and the Togaz-bulak confluent of the Ghund. Ivanoff and Benderski ascended the Kara-su, crossed the second Neza-tash, ascended the Chish-tiube confluent of the Istik, and came down upon Lake Chakmak and the Little Pamir, whence they mounted the Ab-i-Wakhan for a short distance, returning *viâ* the Urta Bel to Lake Victoria, and by the Bash-gumbaz to Alichur. Here the parties reunited, and returned by the Khargosh Pass to the Great Pamir, and down the Pamir river to Yol-mazar. From this point Putiata and Benderski retraced their footsteps and discovered the Andemin or Benderski Pass between the Great and Little Pamirs. Ivanoff ascended

the Mas river, re-examined the Yeshil Kul basin, and marched down the Ghund river as far as Sardim, the highest inhabited village of Shighnan. Having completed their surveys of the central and southern Pamirs, the expedition contemplated a southerly excursion to the Baroghil and Chitral; but finding this impossible owing to the forward movement of the Afghan forces into Shighnan, they ascended the Kudara river, examined the great Fedchenko glacier, and returned to Russian territory in December of the same year, having contributed to Pamir cartography more accurate and detailed information than any preceding or subsequent expedition.*

In 1887, the brothers Grum-Grjimailo, naturalists, traversed the northern Pamir from west to east, visiting the Kudara river and Rang Kul, whence they crossed to Tashkurghan, and explored the upper waters of the Yarkand Daria.

Five years later Captain Grombchevski, a Polish officer in the Imperial Guards, who had been adjutant to Skobeleff in 1876, and later had officiated as assistant-governor at Marghilan, and frontier commissioner in Ferghana, commenced the series of Pamir and trans-Pamir explorations which for a time rendered his name so familiar to the British public. In 1888 he crossed the Hindu Kush, as previously mentioned, by the Kilik Pass, and penetrated to Hunza, where he endeavoured to win over Safdar Ali Khan, then Raja, to the Russian alliance. In 1889 he entered by Karategin and Darwaz as far as the frontiers of Shighnan, where the Afghan incursion put a stop to his plans of further advance. Proceeding eastwards by the Alichur, Great, and Little Pamirs, he crossed the Bayik Pass on to the Taghdumbash, and while on the Raskam Daria encountered Younghusband, on his march from the Shimshal Pass to the Taghdumbash. When he reached Shahidulla, Grombchevski, finding the winter coming on, demanded permission for himself and his armed escort to descend into Kashmir, and was very much offended when this permission was refused by the British Resident. In 1890 Grombchevski and Younghusband again met in Yarkand. In 1892 he was appointed Governor of Osh, and has probably spent more years in and about the Pamirs than any living man.

In 1889 Prince Galitzin passed as a private traveller across the Pamirs on his way to British India. In 1891 Colonel Yonoff commenced the series of military parades in the Pamir region which were intended to impress the few inhabitants and the surrounding peoples with the might of Russian arms, and which resulted in the permanent occupation by the Russians of the Murghabi fort, or Pamerski Poste, so frequently already mentioned. Finally, in 1895 the Boundary Commission, under General Shveikovski, already cited, completed the arrangements under which, by agreement between Great Britain and Russia, the bulk of the Pamirs have passed into the final possession of

* *Invest. Imp. Russ. Geog. Obsh.*, 1884.

the latter power, the Little Pamir remaining as a sort of unpeopled buffer-state between. The era of exploration and discovery in this celebrated region may therefore now be said to have come to an end. The boundaries having been determined, there survives no legitimate cause of political quarrel; and the mystery and romance of the fabled Roof of the World having been extinguished by the theodolite and the compass, and superseded by the accurate delineation of scientific maps, few persons will probably in future aspire to visit a region where fresh laurels are scarcely to be won, and where the necessities of even a traveller's existence are so scant. On the threshold of this new epoch, I hope that some advantage may be served by the attempt which I have made in these pages to resume, expound, and collate the references of the past by the light of modern knowledge, and to show what the Pamirs really are, as viewed from the double standpoint of historical mention and personal experience. I shall never again visit that distant country myself, but I shall be grateful if the studies of ten years have assisted to simplify any of its features or its problems to the understanding of others. The map which accompanied the first part of this paper (in the July number) marks, I would fain believe, a great advance on any previously accessible publication, either in Russia or England, containing, as it does, a mass of information only to be found in Government bureaux, and never previously made public.

Before the reading of the paper, the PRESIDENT said: We are assembled here this evening to hear Mr. Curzon's account of an interesting journey, from which he has lately arrived in this country. Mr. Curzon is not the first Vice-President of this Society who during the term of his office has started upon a distant geographical enterprise, but he is the first Vice-President of the Society who, during the term of his office, has started on such an enterprise and has returned safely to give an account of his wanderings. I am sure that all his associates will welcome him back most warmly, especially as he is about to give us an account of a region which has great interest for geographers, not only of this Society, but for the geographers of all ages. I will not detain you longer, but will now request Mr. Curzon to address the meeting.

After the reading of the paper, the following discussion took place:—

Field-Marshal Lord ROBERTS: I am sure you will all agree with me that we are all indebted to Mr. Curzon for his interesting lecture. To me it is peculiarly interesting, for although that portion of his travels with which I am most familiar has only been slightly alluded to, some of the country which he has so graphically described is well known to me. It has been said that those people who can only pay a hurried visit to India are likely to take a superficial view of the country, and form erroneous opinions regarding it. This may be the case with the ordinary, unintelligent, self-sufficient traveller, for to these people we know that a little learning is a dangerous thing; but it is quite a different matter when a man of quick intelligence visits India—a man with an earnest desire to make himself thoroughly acquainted with the meaning of everything he sees, with the object of benefiting India and enlightening his own countrymen. I am always thankful when such men are sufficiently interested in India to be induced to go and judge for themselves, and bring back correct impressions of our position there, enabling them to speak authoritatively

on the many important questions which must unavoidably arise from time to time with regard to India. I congratulate Mr. Curzon most heartily on the success which has attended his enterprising journey. I read his several letters in the *Times* with the greatest interest, and I can endorse every word he says when he tells us of the supreme importance to us of being prepared for every contingency that could possibly arise on the north-west frontier of India. Valuable as I feel sure the results of Mr. Curzon's march to the Hunza Nagar, Pamirs, and Chitral will prove, I should look upon his visit to the Amir of Afghanistan as infinitely more valuable. The reception accorded to him by Abdul Rahman Khan shows how much His Highness appreciated an English gentleman taking the trouble to come all the way from London to Kabul for the purpose of making his acquaintance. And it is a great satisfaction to me that Mr. Curzon, by his personal observation and inquiry in that country, can now support the view I have persistently urged whenever the question of the defence of the north-west frontier has been discussed, namely, that whatever policy may be adopted, whether offensive or defensive, it is the good-will of the border tribes, and the hearty co-operation of the Afghans and the Amir of Afghanistan, that are essential to that policy being carried to a successful issue.

The PRESIDENT: I regret very much the reason which prevents Lord Dunmore from being present this evening and defending his Murghabi source of the Oxus. The secretary has just received a letter to say that he is suffering from bronchitis, and is not able to leave his bed; nothing else would have prevented him being present. As I believe we have in the room nearly all the surviving explorers who have visited the Pamirs since the time of Sir Douglas Forsyth in 1874, we hope that one or more of them will express his opinion on the question raised by Mr. Curzon, respecting the true source of the Oxus.

General Sir THOMAS GORDON: As I am one of the old explorers, I am far behind the times, because it was twenty years ago since I was there; but I would like to add my tribute of praise to the splendidly successful journey which Mr. Curzon has made, and the excellent manner in which he has given an account of it. I will speak but little, and in reference to only one or two points, one regarding the source of the Oxus. When we crossed it we were quite early explorers; there had been before us at long distant dates Marco Polo and Benedict Goez and Wood. Wood in 1838 went there, and evidently believed, as we did, the popular opinion in regard to the source of the Oxus, and this would account for the idea that has come into political discussions, that the source of the Oxus was the great lake that Wood called the Pamir Great Lake, and so it has remained ever since. We travelled across the river when the whole place was frozen over, in March and April. My scientific companion, who is here to-night—Colonel Trotter, who could talk with much more accuracy than I can—discovered, we thought, that the source of the Oxus was the Murghabi. When we crossed the Aksu valley the whole place was under snow, but on our way back we found a great stream. We came down to the Little Pamir lake, and passed an exit to the east. We then came down to Kala Panja; thence we went up to the Great Lake, and, returning down to the Oxus, found it a running stream unfrozen in the centre.

Colonel Trotter's native surveyor, Abdul Rahman, whose name is now well known, passed afterwards down to Kala Wamar, at the junction of the Murghabi with the Oxus, and gave out that the Murghabi had the greater volume of water; but he was there in the month of June, when there would be more than when it was measured by Mr. Ney Elias. With regard to Pamir, we were much troubled about this, but came to the conclusion it was like a Scotch moor, a flat associated with mountains, lying between ranges of mountains. I have nothing more to say beyond this: I am gratified to find that the geographical work done by my scientific

colleague Colonel Trotter, under circumstances of great severity equal to what you have had so lately brought home to you—I have seen him working with the temperature 26° below zero—all his work done, including his astronomical investigations, has turned out to be perfectly correct, and has been incorporated in the Russian maps, which are very correct, since the Russians have had greater opportunities of pursuing their geographical work than we.

Colonel TROTTER: It was only yesterday that I heard of the lecture that was to be delivered this evening, and I have not been able, as I could have wished, to look up my notes and refresh my memory as to facts connected with our travels in the Pamirs twenty years ago.

With regard to the great question, Which is the principal source of the Oxus? There are red-letter days in everybody's life, and one I always considered a red-letter day in mine was when I thought I had discovered the principal source of the Oxus as being the Aksu-Murghabi river, flowing eastward from the Little Pamir or Chakmak Lake. It was a long and hard day's work, which I recollect describing seventeen years ago in this room. The country had been visited some years before in mid-winter, by an explorer of the Great Trigonometrical Survey, who had erroneously thought that the river issuing from the lake flowed eastward to Tash-kurghan. Our discovery was that this observation was incorrect, and that the water from the lake flowed into the Aksu, called later on in its course the Murghabi river, which joins the Panja branch of the Oxus at Kala Wamar. This Aksu branch I have always considered, and still consider, as the principal head of the Oxus. When we were at Kala Panja, we were not so welcome as Mr. Curzon appears to have been. We had instructions to go on to Cabul if we received a cordial invitation from the Amir, and for this we had to wait. We sent on a native officer ahead, and, after waiting for a fortnight, got a message that the country was so very disturbed that the Amir could not guarantee our personal safety, and as Sir Thomas Gordon was unable to construe that as a cordial invitation, we did not go on. When we returned from Kala Panja, we had with us an employé of the Trigonometrical Survey, who is now in the service of the Amir of Afghanistan. He went down the river from Kala Panja as far as Kala Wamar, and although Mr. Curzon maintains the contrary, he gave us to understand that the Murghabi was far the larger stream of the two. I do not know how long Mr. Ney Elias was at Kala Wamar, and how long his observations extended, but there is no doubt that what at one time is merely a stream that may be walked over is later on a torrent in which nothing can live. I think the opinion of the native surveyor, a careful, painstaking man, ought to be weighed even against that of Mr. Ney Elias. I see that Mr. Curzon has voluminous documents in support of his case, and he will, I hope, later on give me the opportunity of studying them.

Captain YOUNGHUSBAND: I do not wish to enter into a discussion as to the true source of the Oxus, but as I have visited the vicinity of the source which Mr. Curzon claims, it may interest you to hear what I saw upon that occasion. Mr. Curzon crossed from the Taghdumbash Pamir to the Wakhan Pamir. One of the branches of the Oxus flows along the Wakhan pass; I had to avoid that pass for a certain reason, and to find a pass a little bit further south, and on crossing the water-parting I found a small lake with three glaciers flowing into it. Out of this lake there flowed a small stream, which must have joined into that large glacier, the end of which Mr. Curzon discovered. That glacier, I found, took its rise in what I have always considered to be the heart of Asia, because it is at the dividing-line between the three rivers of Asia. On the south of this all the rivers flow down into the Indus and India; then there are the sources of the Oxus flowing down to

Turkistan, Badakshan, and Russian Turkistan; on the east the waters run down into the Yarkand river and Lake Lob Nor. Thus this has some claim to be called the heart of Asia, and I think it would be very satisfactory if in this heart of Asia it may be found that the true source of the Oxus lies.

Mr. CURZON: I foresaw when I had to condense my paper, in a manner that was obligatory in consequence of its extreme length, that I might run the risk of doing inadequate justice to some much greater and more authoritative explorers who have preceded me, and I feel that unwittingly I have experienced that fate. For instance, Colonel Trotter, with whose labours no man is more familiar than myself, and by whose industry no one has profited more than I did, seemed to imagine in his speech, that when I talked about the imperfect information of geographers and travellers, I must have included the party of which he was one of the most distinguished members. I need hardly say that no one who travels in the Pamirs now ever forgets his debt of gratitude to Sir Thomas Gordon, Colonel Trotter, Colonel Biddulph, and the members of that particular party. Not one of us would know what to do, what to inquire, or what to settle, if we had not got the scientific reports and the more popular descriptions of those writers, and no one can be more disposed than myself to render absolute and ungrudging and loyal homage to the pioneers who have done so much more than I can ever hope to do. Nothing would hurt me more than to go away with the impression that anything I had said had in the slightest degree detracted from the value of the work they succeeded in accomplishing, and for which all Englishmen should be grateful. As regards the native surveyor who was sent up to Kala Wamar to inspect the Oxus, I will not argue the question to-night, but will merely ask you to be good enough to read my statement, which has been compiled with the assistance of Mr. Ney Elias. Sir Thomas Gordon has appreciated the fact that, so far from disparaging the testimony of his surveyor, I quoted it on my side.

As regards Captain Younghusband's observations, I am sorry that condensation obliged me to leave out the reference to that part of the journey he has described, when he went over the southern Wakhjir and came down on the glaciers of the upper Oxus to the small lake of which he told us, with the glaciers around it and a little stream trickling out. He saw one of the original tributaries at the source of the great glacier I depicted, but he, as well as anybody who has been in those regions, knows that when you track a great river up to the glacier from which it springs, you must be content to regard that as its source, and not ferret out the little streams that feed the glacier. He has supplied confirmatory testimony to the theory I have explained to-night, and for the proper explanation of that theory I would refer you to the more sustained discussion which I hope to print in the journal later on. Before sitting down I should like to convey my respectful tribute to Lord Roberts for the graceful and complimentary words he has spoken. When a traveller on the Indian frontier meets, as I did, with the encouragement of Lord Roberts before he starts, and the approbation of Lord Roberts when he returns, his reward is such that he wants no better. I did not speak of Afghanistan to-night, partly for the reason I named, that it was not a journey of geographical discovery, and still more because in the pure atmosphere of this room we are safe from the contagion of that Chamber to which I am shortly about to adjourn. It is almost impossible, in talking of Afghanistan, to avoid politics, unless one has the ability and great command of tactics displayed by Lord Roberts. Not having that ability, I thought I had better avoid the matter altogether.

The PRESIDENT: It now only remains for us to return a very cordial vote of thanks to Mr. Curzon for his paper, of the great importance of which I need say very little. For the question of the source of the Oxus has engaged the attention

of geographers from the earliest ages, and before the days of Goez and Marco Polo. We have had an excellent monograph on the subject from Sir Henry Rawlinson, whose decease we have had on more than one occasion to deplore. Two years afterwards, we had another exhaustive report from Sir Henry Yule, and I cannot but take the opportunity of mentioning that Sir Henry Yule had the same appreciation of Lieut. Macartney as Mr. Curzon. He mentioned that Macartney, with regard to certain points, was still far ahead of all modern writers. The attention devoted to the subject by these great geographers proves the importance of Mr. Curzon's paper. We must also appreciate the difficulties he overcame from cold and want of supplies, and the obstacles in the way of obtaining information, and I am sure I can appeal, with certainty of an appreciative answer, to those assembled here for a hearty vote of thanks to Mr. Curzon, for the charming way in which he delivered his address.

A JOURNEY THROUGH THE TAKLA-MAKAN DESERT, CHINESE TURKISTAN.*

By Dr. SVEN HEDIN.

THE centre of the western part of the Gobi desert, which occupies nearly the whole of the Tarim valley, with the exception of a narrow strip of cultivated land along the base of the mountains, as well as the banks of the adjoining rivers, was never visited by any European traveller; and as we had no information as to the real character of those regions, I made up my mind to make an investigation. My plan was to cross the Takla-Makan desert from the Yarkand Daria to the Khotan Daria, being of opinion that such a journey would not meet with unsurmountable obstacles, as I intended to travel along the south-westerly line of the Masar Tagh, where the sand-mounds were low, and where we might find water and grass. At the base of this mountain range, which, according to Prjevalsky, should go straight through the desert, I even hoped to find remains of an ancient culture which might throw light upon the older history of Central Asia. I intended to cross the desert and continue to Keria, and during the summer investigate the plateau of Northern Tibet. Great care was therefore taken in the outfit of the expedition as far as instruments, clothing, and provisions were concerned.

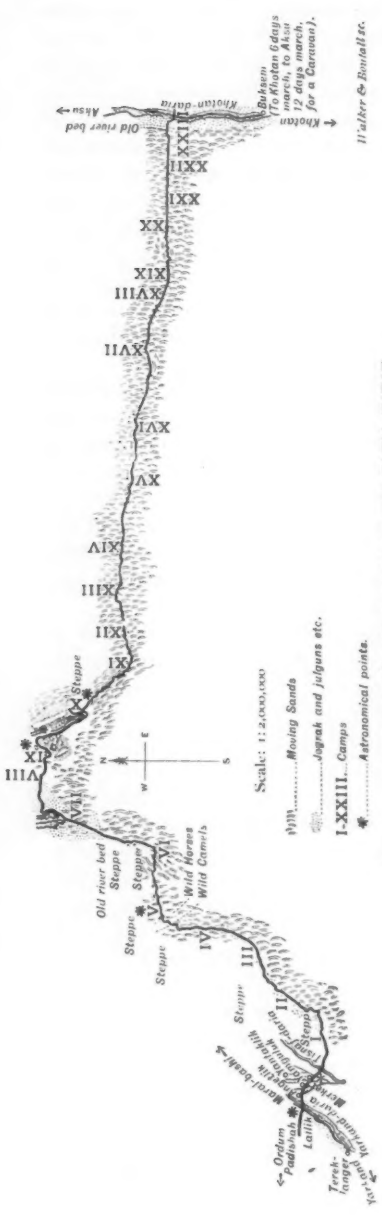
With four servants I left Kashgar, February 17, 1895, and arrived at Maralbashi February 23. After having made a short trip to that part of the Masar Tagh which lies between the Yarkand Daria and the Kashgar Daria, we proceeded on March 2, *viâ* Shamal, Aksak-maral, Alagir, and Meinet (Menut), to Lailik. From the latter point I rode to the holy grave of Ordan Padishah, which was faithfully described by Bellew when he visited this place twenty-one years ago. On returning to Lailik we proceeded on March 19 to Merket, on the right bank of

* Dated "Kashgar, October, 1895."

the Yarkand Daria, where I stayed for twenty days on account of the difficulty in getting camels, which, however, my servants at last succeeded in getting in Karghalik. According to the latest maps, the distance between Merket and the woodlands of Buksem by the Khotan Daria is 180 to 200 miles, and we ought, therefore, to be able to finish this trip in twenty days, even if the road should be somewhat difficult. As we should probably be unable to find any water, we had to prepare for this emergency, and brought with us a supply for twenty-five days. The water was kept in four *tyellek* (iron tanks), containing in all about eleven gallons, and six *tullums* (goatskin bags), containing in all about three and a half gallons. For the camels we brought with us oil and *kindzerek* (an oily substance which is left after pressing the oil out of the Kundshut fruit), which not only gave the most nourishment in the most concentrated form, but also took up the least space. For ourselves we brought along a supply of rice, four hundred loaves of bread, *talkhan* (scorched flour), *goman* (macaroni), honey, butter, and potatoes, all bought in Yarkand. Besides this, I had a good supply of preserved food; and lastly we bought three fat sheep (which faithfully followed the caravan till they in turn were killed); eleven fowls, including a cock, which always used to wake us in the morning. Three of the servants that I brought from Kashgar left me here in fear of the desert; only Islam-Baj, of Osh, who had already served me faithfully for two years, was as usual not afraid, and followed me gladly.

At Merket I employed (1) Muhamed-Ikhah, sixty-five years old, of Yarkand, who thoroughly understood how to handle camels; (2) Kasini-Akhun, sixty years, of Yangi-hissar, who for six years had made trips on foot into the desert, in search of gold, always starting from Merket, where he was well known as a daring desert man; and (3) the forty-years-old Kasim-Akhun, of Yarkand. Altogether I had now four men. The caravan consisted of eight big camels—all males, and strongly built—of the kind which are used only on the level, and never in the mountains. The youngest was one and a half year, three were two years, one four, one eight, and one fifteen years old. The last mentioned died first; the eight-years-old one, a pretty white camel, and one of the two-years-old were the only ones that came through; the other six died of thirst, and all the other animals—dogs, sheep, and fowls—as well.

Early in the morning of April 10 the caravan was ready for the start. Water-tanks, boxes, provisions, tents, and all other requisites were placed on the camels, and I mounted one of the largest ones, called Boghra. Over all these various boxes containing instruments, etc., blankets, fur coats, and cushions were spread, covering the camel's humps, thus forming a complete bed, on which we felt very comfortable as soon as we got used to the camel's waddling walk. Even for transporting chronometers the camel is the best carrier I ever tried, and their


Old river bed
Aksu
Khotan-daria
Bokem
To Khotan 6days march, to Aksu 12 days march, for a Caravan).
Khotan
Walker & Boulail sc.
XXII
XXI
XX
XIX
XVIII
XVII
XVI
XV
XIV
XIII
XII
XI
X
IX
Steppe
Scale: 1:2,000,000
Mm.....Moving Sands
.....Jugrak and julguns etc.
I-XXIII...Camps
.....Astronomical points.
Old river bed
Steppe
Steppe
Wild Horses
Wild Camels
Steppe
Steppe
Steppe

kanrish* and scattered bushes. On this steppe we found the first indication of sand-mounds. These mounds are quite rudimentary, but show distinctly their northerly and southerly direction. It ought, however, to be mentioned that at Merket there stands an isolated mound of considerable dimensions—12 to 18 feet high—from which a splendid view of the town may be had. After marching over 10 miles in an east-south-easterly direction, we camped on the edge of a shallow ravine, 15 to 20 feet broad and 5 feet deep, covered with *kamish* and bushes. My men dug a well in the bottom, and found brackish water at a depth of 3½ feet, where the temperature was 50° Fahr., the air at the same time being 76·5°.

Kasini-Akhun from Yangi-hissar told me that seven to eight days in a north-easterly direction there was a mountain called Chakmak-tagh, which extended in the direction of east by south-east; the eastern part of the mountain was called Akchok. Ten days further east a big lake was said to exist, into which a river formerly had run. Along the shores of this lake pastures and "tograk" (poplar) were found, as well as an old ruin called "Eski-Shahr" (the old city). From this point there was said to be only one day's march to Masar-tagh, and then only a short trip to Khotan Daria. To the north of the Chakmak mountain there was supposed to be a path which, passing a mile-post or *yayach-mishan*, led to an old ruin by the name of Kish-Kishlak (the winter town). This place was, of course, not inhabited, as, indeed, it was not inhabitable. In the southern part of the Takla-Makan there was supposed to exist many ruins of ancient towns. The desert man's story was not confirmed by facts during my journey through the desert. He seemed, however, so positive on this occasion, that I really believe he told the truth. It is not impossible that we may have passed an isolated mountain range without noticing it when the air was filled with sand and dust.

On April 11 we woke up during a heavy storm from the north-east, which filled the atmosphere with dust. We started, however, and proceeded as much as possible in an easterly direction. Our compass was the whole time our most important instrument. Just after leaving the camp the sand became very heavy, and the mounds, being from 16 to 20 feet high, were all lying north by south. At the same time we found here and there *tograks* † and *juglun*,‡ with branches hard as glass, that broke with a sharp sound as the camels passed. Further on, the mounds became irregular and more like waves. The same physical law which makes the waves grow considerably higher in meeting others coming from a different point, seems also to apply to the sand. For instance, if two currents of sand produced by opposing contrary winds should cross

* Kanrish = *Lasiagrotis splendens.*

† *Populus diversifolia* and *Populus balsamifera.*

‡ *Juglun-tamarisk* = *Tamarix laxa* and *Tamarix elongata.*

each other north by south, or east by west, the mounds grow to a considerable height, and, at the intersection, often take a conical shape.

The sand was now getting very hard—my men called it *kattick-kum*—leaving no traces of the footsteps of the camels, but greatly facilitating their march. After a while the sand became so heavy that we were obliged to take a turn to the north, but afterwards we again found a clear road. If we had continued in an easterly direction we should, within a day (according to Kasini-Akhun from Yangi-hissar, after this called "the desert man"), have reached a part of the desert in which the sand was so deep that we should have been forced to turn back. The ground was level for only a short distance. Very soon we met small mounds 6 to 10 feet high, and they were sometimes covered with a very loose and finely distributed sort of dust, into which the camels stepped as if in water. Very often we had to take several turns to avoid these mounds (*beles* in the native language).

The north-easterly wind continued until six o'clock, and the atmosphere was all day so filled with dust that the sun was invisible. During the following days I noticed that the north-east and east wind carried along the dust even when not blowing very hard, while the atmosphere under north-westerly and westerly winds always remained clear. After a strong easterly storm this dust remains in the air for a couple of days, but as soon as a westerly wind comes the dust vanishes. Towards the end of our day's march we passed *tograk* growing sparely here and there, and immediately on our right hand we had heavy sand. In camp 2 we found water at a depth of less than 2 feet, the temperature of which was 50°. We had travelled 13½ miles in an easterly direction.

On April 12 the mist continued, although there was no wind. We started, as usual, at an early hour, the packing of the camels generally taking an hour and a half. We tried in vain to work towards the east. The mounds to the right, however, forced us in a north-easterly direction. We found a *tograk* here and there. These trees always grow on the top of a conical mound, and the roots help to hold the loose and dry sand together. These cones are 6 to 10 feet high, and are very much like those we saw on the way from Kashgar to Maralbashi. Their existence may be due to the opposing contrary winds, although I should think that the dust which constantly falls would at last hide them. In some places the ground was slightly damp, and covered with a dry, salt crust, which crashed beneath the camel's hoofs. These damp spots made an impression in the ground, and water could no doubt be found at a depth of 5 feet.

We passed another stretch of *tograk* before reaching the next steppe, which was scantily covered with *kamish* and bushes. This steppe we had on our left-hand side, while on our right we had still heavy sand. The mounds pointed straight northwards, but were only a few feet high, and had a very broad base. We met to-day again the same kind

of soft sand into which the camels sank knee-deep, and only proceeded with difficulty. There we also found signs of animal life. We saw a rabbit, which instantly disappeared, and further on we found a path towards the south-east made by deer (Marals). The "desert man" thought that this path probably led to a lake or an oasis (Yeilan). At camp 3 we found brackish water at a depth of 5½ feet (50° Fahr.). The animals drank this water with delight. Distance covered, 15 miles north-east. To the south of our camp there was said to be a lake called Yeshil-Kul (the green lake). None of my men had ever seen the lake, and I did not believe in its existence.

On April 13 we passed several small stretches of *tograk* and sand-mounds, from 65 to 160 feet wide and 6 feet high, all pointing northwards. The steep sides of these mounds face westwards. Very often the mounds were convex towards the east. To-day we met for the first time green *tograks*, with light green leaves; these were eagerly consumed by the camels. The last part of the day's march brought us into heavy sand formed into irregular mounds, sometimes crescent-shaped and sometimes circular, with the steep side towards the south-west. At camp 4 we found water at a depth of 3½ feet (temp. 50°). Distance covered, 13 miles; north 21·8° east. Lizards, spiders, and moths were the only living creatures to be found. The fact that we always found water at a small depth, and the direction we followed, led me to believe that we could not be very far from the Yarkand Daria. The "desert man" tried to make me believe that we had gone so far from the river that it would take four to five days to reach it. I had found out, however, that all his reports up to this time had been unreliable, so that this one was probably of the same kind.

On April 14 the desert had the same character as before, with *tyonghum* (high sand) to the right; here and there we passed *tograks* between the mounds. During the two following days I noticed that as soon as we came out of the sand and on even ground the *tograks* disappeared. From this I was, however, not able to draw any definite conclusions; I merely record the fact. The formation of the mounds near the stem of the *tograk* is very changeable. Sometimes the mound seems to leave the *tograk* alone and to go round it, and sometimes the tree is wholly embedded in sand, only the branches being visible. I suppose that this is due to the fact that the *tograk*, being entirely dependent on the water in the ground, grows in small hollows invisible to the eye where the water is nearest. Maybe these elevations of the ground to some extent owe their existence to the phenomena of capillarity. Shortly afterwards the character of the desert completely changed. The brown ground was as level as a floor, and so hard that the camels' hoofs only made an impression of one-fifth of an inch. There we saw a few scattered sand-mounds very sharply distinguished, 3 to 6 feet high, and standing on a broad yellow-coloured base. They resembled small wooden blocks placed on

a smooth mahogany table. We tried as much as possible to avoid the mounds and ride on the hard ground, thereby being forced more northwards. In the open spaces we found many small pieces of a very hard shell-shaped flint, round pieces of porphyry, and the same minerals I had found in Ashur-tag and Turnshuk-tag (on the road to Aksu), in the mountain range at Masar-Alldi; these small minerals we afterwards found in Masar-tag. All these small isolated mountains, the outermost standing on the left-hand bank of Khotan Daria (six days' march to the north of Khotan), are ruins of an ancient mountain chain which stretched through the present Takla-Makan, and seems to have been parallel with the eastern part of the Pamirs. Later on I shall find an opportunity of speaking of the great importance that attaches to these hollow-ground pieces of stone, which have clearly obtained their shape in running water. I may here mention that such a piece of land as this, level hard ground covered with stones, is called in the native (Turkistan) language Sai; the same name is also used in indicating the dry, stony bed of a river.

After a couple of hours' ride the loose sand was decreasing, and to the left we again saw the steppe covered with bushes. Here we made an unexpected discovery—we found the first sign of the wild camel (*yava-tuyasi*). The footprints which we observed went in the direction north-north-west and south-south-east, and seemed to indicate that the animals came out on the steppe to find food, afterwards returning to the desert. Possibly this might tend to prove that a lake (Yeshit-Kul?) surrounded by pastures really existed in the south. Shortly afterwards we found marks of the wild horse (*khulan*). I was very much surprised by making these discoveries, for, as far as I remember, I have never, in any description of Eastern Turkistan, seen these animals mentioned. The "desert man," however, said that their appearance was general, and that he had often seen them himself; not seldom they would come down in herds to the banks of the Yarkand Daria in search of water and food. I heard afterwards that they even come down to the Khotan Daria, and that they sometimes come from the east of the desert, and, passing the river, proceed to Takla-Makan. At Aksu I was told that in the town of Shak-yar, by Tarim, there was a number of daring and clever men who made a living by hunting the wild camel and the tiger; the skins they sold to the merchants and tanners in Aksu.

On reaching the steppe, my men discovered a herd grazing, but before I got my field-glass adjusted, and before we were able to decide whether the animals were camels, wild horses, or deer (*marals*), they disappeared northwards in a cloud of dust. Our dogs, that always kept in the shadow of the camels, disappeared here suddenly, and when they returned in about an hour, to our surprise we discovered that they had bathed. We continued, however, in the same direction, and by a mere chance we came to a lake containing clear fresh water. This lake was

about 250 feet long and 12 feet wide. The water was about 3 inches deep, and at the bottom, which was muddy, there grew some water-plants. Water-spiders and beetles were numerous, and were eagerly devoured by the fowls. In this connection, I may mention that all my collections of insects—principally beetles—and plants made during the first thirteen days were lost through the disaster that afterwards befell the expedition. By a mere chance, however, my collection of minerals and sand samples were saved. The little lake seemed to me so delightful, that I resolved to camp here. One could plainly see the water coming up from small holes in the bottom, as from a spring. The temperature of the water was 70°, and of the air 78°, at 5 p.m. By 9 p.m. the temperature had gone down to 59° in the water, and 60° in the air. On April 16, at 7 a.m., the temperature of the water was 49°, and in the air 55°. Distance covered, 11½ miles; direction, north 14·4° east. Still the air was so full of dust that the sun could not be distinguished 20 degrees above the horizon. All the time we had tried hard to get towards the east, but, on account of the high sand, we had been forced in a north-easterly direction. We had very little knowledge of the character of the desert we were coming through and of the chances of finding water, so we decided to camp here.

April 15.—The camels and the other animals now had a chance to get all the water and grass they wanted. Our water-tanks were also refilled. It was a curious incident that the fowls on this day of rest laid four eggs; hitherto I had only got one a day. To-day we killed a sheep. During the night our dogs barked continually towards the road on which we had seen the footsteps of the camels; undoubtedly the herds seek the water after sundown. At 1 p.m. the temperature in the sun was 165° (82·8° in the shade); one hour later the temperature of the sand was 112°.

Leaving the lake on April 16, we again met mounds 10 to 13 feet high, north by south. The sand was soft and most difficult to get through; we had to ride zigzag up and down the sand-hills. After a while we came to an open space, where we again found *tograks*, *julgun*, and *kamish*. Here we passed another lake, and soon afterwards a third one. My men thought that this was Kulldenazagi, or the end of the big lake; but, as all these lakes went in an east-north-east direction, and lay in the same line, I concluded that they had formerly formed parts of an old river-bed. Round the last lake we found numerous marks of wild camels and horses. Mounds now appeared again, sometimes as high as 16 feet, and for a short stretch they lay east by west; however, they soon again took their usual course, north by south. Open spaces became now more frequent; *julgun* and *kamish* appeared. To-day we covered 15 miles; direction, north 87° east.

April 17.—At 4 a.m. the sky was perfectly clear, and the stars shone brightly. At 7 a.m. the sun was hot, although a westerly wind was

blowing. The wind had cleared the air, and, thanks to this, we discovered in the distance a large mountain range, with smaller extensions both right and left. The "desert man" believed it was Masar-tag, and I resolved to investigate it. After having passed a stretch of sand 12 feet high, we came out on a plain that seemed to lead right to the foot of the mountain. Here and there we passed scattered mounds, and both *julgun* and *kamish*. Further on we again found mounds of considerable height, sometimes up to 20 feet. The ground now became more uneven, and we passed a small salt-water pond, and afterwards one containing fresh water. I became more and more convinced that these ponds were the remains of an inundation from Yarkand Daria in the spring of last year. I discovered to-day that the water not only creates these small lakes near the rivers, but even, through natural canals, finds its way into the deserts. We passed a 125-feet wide and 6-feet deep river-bed which went from west to east, and where still a little water was left. The bottom was sandy, and *kamish* grew on the banks. Over half a mile further north we could see a river-bed similar to the first one, and clearly distinguishable. In the spring, when the Yarkand Daria carries enormous quantities of water, the overflow is bound to find an outlet, and undoubtedly it flows eastwards into the desert through selfmade channels in the lower ground.

Any one who has seen the Yarkand Daria will know that this river carries along a good deal of *débris*, sand, etc., which remains in the river-bed as soon as the swiftness of the current abates. In this way the river-bed constantly grows higher, and the water has to seek new outlets. As a matter of fact, this moving of the river-bed goes in an easterly direction, and I have particularly noticed this on the western side of Yarkand Daria, between the river and the holy grave of Orden Padishak, where two old river-beds, running parallel with the present river, can be distinctly seen. The two dried-up river-beds recently mentioned also show that there is a tendency towards the east.

The air was clear all day. During our march we had noticed in the far distance a dark cloud, which we now found was due to the vapour coming from the river-beds. Similar vapour-columns, but much larger ones, we also saw the following days, towering high above the Yarkand Daria banks, the dry atmosphere rapidly absorbing the vapour. We proceeded over an uneven ground with scattered mounds, where a few *yantaks* * were growing, and again met *tograks*, which were so plentiful that it looked like a regular forest, or *yangal*. Here we rode between high mounds for one hour, direction north-north-east; sometimes the mounds were as high as 30 feet, and their west sides were very steep. We crossed a few mounds before we camped between a couple of old *tograk* trees. Distance covered, 17½ miles; direction, north 18° east.

* Yantaks = *Alhagi camelorum*.

April 18.—To-day we had strong gales from the north-east, and the air was as usual filled with dust. The heat during the day was less oppressive on account of the dust, but the temperature higher than usual at night. The mountain to the north could not be seen through the mist and the forest. The trees had still that same yellow-greyish colour, and only in a few places we saw some green *tograks*. Here and there between the trees mounds were seen, but the land had altogether lost the character of a desert. The mountainous desert had been succeeded by a marsh covered with trees and *kamish*. We had often to take a roundabout way on account of the marsh, which gradually took the form of a long lake, that became wider northward and had many creeks, and even contained small islands covered with bushes and *kamish*; on the shores were plenty of ducks and geese. We followed the eastern shore northwards through *tograks* and mounds, and reached another lake just like and parallel to the first one. Both lakes, which probably form parts of a big lake in the north, run out southwards between the sand-hills and follow their outlines. Alongside the last-mentioned lake we rode on a sand-hill of considerable dimensions between the trees. At the foot of this sand-hill there ran a dark stripe of faded leaves and branches of trees, showing that the surface of the lake at high water was 20 inches higher than now. The small islands covered with *kamish* showed that the water could not be very deep. To see the clear, deep-blue water through the fresh green leaves was a sight late to be forgotten. The water in the lake is fresh and clear. In my mind, there is no doubt that these lakes have been created by the yearly inundations from the Yarkand Daria. When the overflow ceases towards the summer, some of the water evaporates; when the winter comes, the remainder freezes, melts again in spring, and gradually gets less; in May or June the new supply comes, and the lake reaches again its maximum.

Leaving the lakes on our left, we now took an easterly course, and came through such thick *kamish* that only those who rode could have a full view in front. Later we came out on a long plain, where the finest grass was growing; here and there were scattered groups of trees. But the forest grew thicker, and at last got so thick that we had to use axes to cut our way through. At last we were out of this forest near the Yarkand Daria, and reached the open steppe, where in east-south-east we discovered another mountain. In the dusk we camped on an isolated mound, where we found a great many scorpions. Distance covered, 16 miles in constant turns; direction, north 50° east.

April 19.—The mountain first seen could now be faintly discovered to the north. This is the mountain that stands on the right bank of the Yarkand Daria, and is a continuation of the Masar-aldis mountain, which I early in the spring had visited. We decided to steer our course towards the small mountain in east-south-east, which could be easily

seen through the mist, and consequently could not be far away. We had to pass some very uneven ground, often interrupted by damp ravines, which we had to go round. To the right there is a stretch of marsh land, and to the left grows a number of *tograks*—young, green, and fresh looking, where many crows had gathered. A small range of mountains, completely separated from the main mountain chain, was now our destination; but, coming nearer the base, we found that a lake lay between us and the mountain. This lake went in a northerly direction, where it had an outlet. We therefore turned towards south and east, between the lake and the big mountain. At the base of this were many mounds, which went right up in the clefts of the mountain. We found now that the lake was divided into two parts by a narrow swampy isthmus; *tograks* and *kamish* grew on the banks, and there were also indications of the water having been higher. The water was clear and fresh, and geese and ducks were numerous as usual. The eastern half of the lake disappears in a swamp, and a number of ponds stretch far northward. Between these and a mountain range pointing northward we continued our march, and finally stopped by a small lake, along the shores of which were plenty of *tograks* and *kamish*. I decided to stay in this delightful oasis the whole day of April 20. Besides, I wanted to take some astronomical observations and make a geological excursion. As to the result of the latter, I will refrain from saying anything before the specimens I brought back have been analyzed; suffice it is to say, that the minerals were of the same finely grained and hard kind that I found in the small mountains near the Kashgar Daria conjunction, and that in several places I found veins of porphyry. From the top of the mountain lying to the south of our camp I had a splendid view of the neighbourhood. To the south-west I could see the two small lakes with their clear water, in which could be seen the surrounding mountains as if in a mirror. Straight westward I could see the little isolated mountain with high mounds at the north-eastern foot, which had dammed up the marshland. To the west 320° north, I found the large mountain we first of all discovered, and which cannot be any other than that near Masur-alldi. Of my investigations round this last-named mountain I do not find time to speak now. Between our camp and this mountain, as far as north 30° east, there is an even plain covered by marshes and ponds and fertile vegetation. This swamp and all these ponds, no doubt, form one great lake at the time of the inundation. It is, however, a curious fact that the deepest parts of these depressions are found round the foot of the mountains, where the largest quantities of water remain, although the *débris* from these fast-crumbling mountains ought to add to the height of the ground. I may also note that all these small ponds lie in a westerly direction from the mountains and their extensions, which is clearly shown in Fig. 2. In the first instance, we may conclude that the sand and the atmospheric dust leaves only a very small quantity

(or next to nothing) at the mountain's south-western base; that is to say, to the leeward of the prevailing north-easterly and easterly winds, and that the ground here consequently would become proportionately lower. When we the following day went round the whole complex of mountains, I received full confirmation of the conclusion above arrived at. Towards north-east and east all the extensions were covered with mounds, but as a rule parallel with the length of the mountains, and all very irregular in shape; on the western and south-western extensions not a trace of sand could be found, the ground being either hard or

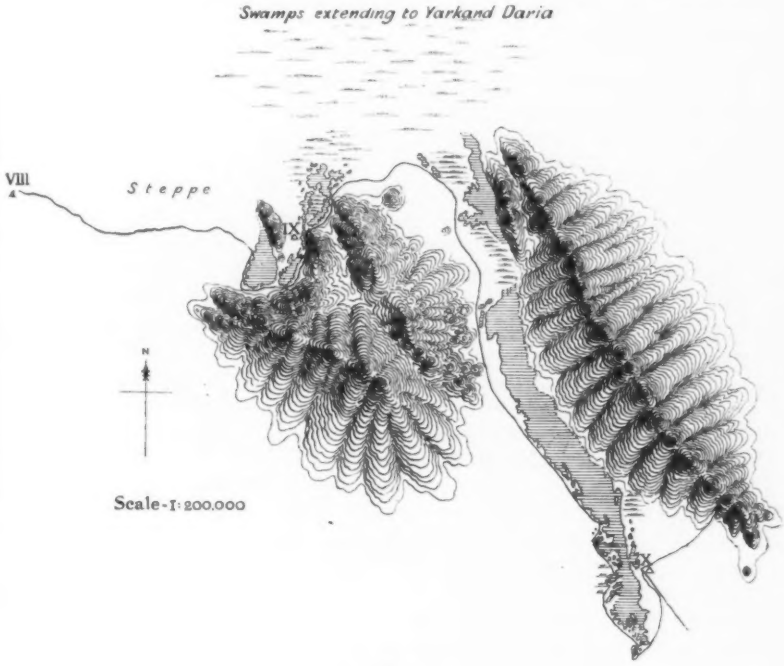


FIG. 2.

covered with gravel and *kamish*. It is, however, quite natural that the sand, carried along by north-easterly and easterly winds, must find a barrier in these mountains. In their formation the mounds have been disturbed at the base of the mountain, and get thinner the higher they get up; they do not, however, reach the top.

To the east of the mountain extension where I had my look-out, is another one running parallel with the first one, and between these two there is a gently sloping valley covered with grass and *débris*, and with a network of dry canals, which are only filled with water after rain and when the snow melts, for of permanent ponds there are none. Generally,

these mountains are fast crumbling, which is a natural consequence of the enormous changes in the temperatures of winter and summer, and even between night and day. I calculate the height of this range at from 800 to 1000 feet.

On April 21, when we passed these two mountain extensions, we again encountered high mounds which blocked the north-eastern slope. To the left we had marshland with *tograks* and *kamish*, and in front of us we saw another mountain, higher than the one we had left. Here and there the *tograks* take the form of a thin forest, and here we also found a path, which the "desert man" explained was an old short cut to Khotan Daria.

We now took a more southerly course between the two mountain chains laying north-west to south-east. The *tograks* gradually disappear, and we are again on the steppe covered with *kamish*. To the left there is a very long lake, only in one place broken by marshland. As far as the eye can reach the lake goes in a north-easterly direction, and probably alongside the south-western base of the eastern mountain. To the right the mounds tower up on the north-eastern slopes of the western mountains, whose cliffs only here and there can be seen peeping out of the sand. The ground gradually gets hard, now and then covered with a little *débris*. At the northern end of the largest lake, where there stands a big isolated rock, we met to our surprise a man, who had come there from Maralbashi to get rock salt. The salt was found high up on the mountain, was perfectly clean, and looked very nice. This man, who had a couple of cart-horses with him, sells the salt to the bazaars in Maralbashi. He had no information of importance to give, but only confirmed what I had already noticed. To Maralbashi there was not quite a two days' march in direction west 330° north; to the south and east there was a sandy desert, but the man had no knowledge of this fact. To the left the long lake continues; there are no islands in it, but plenty of grass. Here and there the lake is surrounded by a swamp; otherwise the ground is very hard, does not even leave any trace of the camels' footsteps, and is absolutely void of vegetation. Even in this lake there were signs of the water having been higher; and the fine sand on the shore was just like finely-chiselled waves. The southern slopes of the western mountain chain sink gradually more and more, and at last are completely covered with sand; they continue towards the south in a long sand-comb. After having left the last mountain slopes, we had the boundless desert on the right hand.

It was my desire now to come nearer to the eastern mountain chain, but we were constantly obstructed by the lake, which, however, became more narrow towards the south. We were therefore bound to turn southwards, where the lake sends out long and narrow arms, just like fingers pointing southward. The ground here gradually rises, putting a stop to the further advance of the water. When we at last had come round

the southern point, we turned towards north and north-east, and arrived at the eastern shore, where we found grass for the camels, but no trees.

On April 22 we were in camp 10. The camels here had another chance of getting all they wanted to eat and drink. I made a trip to the south-eastern point of the mountain, which has the form of a cape, with a little rocky island in front. From this point I had a splendid view of the long lake, and I had a chance to verify my map sketches. To the north-east, east, and south-west is nothing but desert as smooth as the sea. Far away I could discern the first mounds. The day was exceptionally clear; highest temperature (black bulb) at 1 p.m., 180°, 92° in the shade (?). I had brought with me my strongest field-glass, and carefully examined the horizon, but not a mountain to be seen, only desert and mounds. When Prjevalsky in 1885 returned from his last journey, he followed the Khotan Daria northward, and discovered, about six days' march from Khotan, on the left bank of the river, a little mountain which extended northward towards the desert. The natives called it Masar Tagh. Now, Prjevalsky knew that there was one Masar Tagh by Maralbashi, and as the natives assured him that the one by Khotan Daria extended just in the same direction, as far as could be seen, he concluded that they belonged to the same mountain chain, and he marked them down on his map as lying straight across the desert of Takla-Makan. Mr. Carey, who together with the unfortunate Mr. Dalgleish, in the year 1885–86, also travelled alongside Khotan Daria, saw the same mountain, but laid it down on his map as an isolated mountain, which showed more caution, and no doubt also is correct. However, all the Russian maps of East Turkistan and the splendid map of "Tibet and the Surrounding Regions," published by the Royal Geographical Society, as well as several others, have a whole mountain chain across the desert. In Map 60 in "Stieler's Hand Atlas," there is, however, as a sort of precaution, only printed the name without further comment. It is evident that if a continuous mountain chain really existed, we ought to have discovered it just at the point where we now were, but neither here nor further on were we able to discover even a sign of a mountain. It is even less probable that Masar Tagh by Khotan should have the slightest connection with the first-mentioned apocryphal existence of Chak-mak Tagh and Ak-chok, because in such a case we would have passed them. I feel fully convinced that the one Masar Tagh near which we camped on April 22 is totally isolated, and that this is also the case with the mountain seen by Prjevalsky and Mr. Carey. The latter mountain I have not yet visited, but at Buksem (Khotan Daria) the hunters told me that it might be rounded in five or six days. At the top there is a holy grave (masar); hence the name.

When we started on April 23 and left the newly discovered mountains and lakes, I was still of the opinion that if we continued south-eastward we would again come to a mountainous region with lakes and

ponds. Not finding, however, any signs at all of mountains, we steered our course eastward (with a slight deviation towards east-south-east), in order to reach Khotan Daria by the shortest possible route. While resting ourselves, I and my men had a consultation. The "desert man" up to this time had been a very good guide, and his advice had been of considerable value in discovering the new mountain and the lakes, consequently we placed a good deal of confidence in him when he assured us that we had only a four or five days' march to the Khotan Daria. I may here add that on all the maps I had in my possession the distance between the point where we were and the Khotan Daria was given as between 70 and 75 miles. I gave strict instructions to fill the water-tanks for a ten days' march; further on, when it was too late, I found out that my men had only taken a four days' supply. The result of this negligence was the death of two men, six camels, and all the other animals.

As already stated, we left the camp on April 23. During the following two weeks we always sent our thoughts back to this little paradise on earth that we left behind. We steered our course south-eastward to look for the mysterious Masar Tagh. The ground was perfectly hard, and partly covered with soft dust, and now and then with bushes and kamish. Then again we passed cones and hills of clay. In this desolate place, however, there was no other sign of life than the footsteps of the antelope and other animals living in the desert. After an hour and a half's ride, we again met mounds 18 to 22 feet high lying north-west by south-east, and with steep inclines towards south and south-west. A single *yulgun* grew here and there; this *yulgun* is a typical desert tree, and does not appear near the lakes. After two hours' ride, the mountain we had left disappeared in the mist, and afterwards we did not see any trace of a mountain. The mounds made it now more and more difficult for us. For a while we followed in the direction of the mounds, but very soon we met another range of mounds crossing these, whereby pyramids of sand were formed often as high as 60 to 65 feet. During the latter half of our day's march, the sand-combs were as high as 80 to 100 feet. My men called this sand *chong-kum* (heavy sand), or *yaman-kum* (bad sand). As much as possible we rode on the top of these sand-hills to save the trouble of going downhill and then up again, but as a consequence we were obliged to take more turns, as we had to make use of the eastern sides of the mounds, which were more rounded. Once in a while we came, however, to the edge of a very steep precipice which we could not pass round, and here the camels went right ahead and slid down through the sand to the base of the mound, never losing their balance. Sometimes we had to use spades to work our way through the sand, where we also found the last bushes of *yulgun*. We tried to find water by digging, but, not finding any at a depth of 2½ feet, we gave it up. A few moths flew around my candle during the night; the next day even these insects had vanished.

(To be continued.)

DR. NANSEN'S RETURN.

THE news telegraphed from Vardö on August 13, that Dr. Nansen had arrived at that port on board the *Windward*, has been received with the most lively satisfaction throughout the civilized world. Although no special cause for disquietude as to the fate of the brave explorer had arisen, the mere fact that fully three years had elapsed since the date of the last communication from him (sent from Khabarova, in Jugor strait, on August 3, 1893) could not but create a certain feeling of anxiety, now replaced by a corresponding sense of relief that all has gone well. Our warmest congratulations are offered to Dr. Nansen on his splendid achievements, hardly to be matched in the whole history of Arctic exploration. The following are the broad outlines of the story of his expedition, taken from the detailed account telegraphed by the explorer himself to the *Daily Chronicle*, which deserves much credit for its enterprise in the matter.

As reported by Captain Wiggins (*Journal*, vol. iii. p. 122), there was much ice on the Siberian coast east of the Yenesei in 1893, but the *Fram* forced a way through, many islands being met with along the coast, in addition to one reported as discovered in the Kara Sea. The mouth of the Olenek was reached on September 15, too late a date to admit of landing to take in the dogs arranged for. On the 18th the New Siberian islands were passed, and on the 22nd the ship was made fast to a floe in 78° 50′ north, 133° 37′ east, having already apparently drifted some distance towards the north-west.

Regarding the experiences of the next eighteen months, during which the *Fram* remained fast in the ice-pack, Dr. Nansen says, "As anticipated, we were gradually drifted north and north-westward. During the autumn and winter the *Fram* was constantly exposed to violent ice-pressures, but she surpassed our expectations, being superior to any strain. The temperature fell rapidly, and was constantly low, with little variation for the whole winter; the lowest temperature was 62° below zero. Every man on board was in perfect health. The electric light generated by the windmill fulfilled our expectations. . . . The sea was up to 90 fathoms deep south of 79° north, where the depth suddenly increased, and was from 1600 to 1900 fathoms north of that latitude. This will necessarily upset all theories based on a shallow Polar basin. The sea-bottom was remarkably devoid of organic matter. . . . Under the stratum of cold ice-water covering the surface of the Polar basin, I soon discovered the warmer and more saline water due to the Gulf Stream, with temperatures ranging from 31° to 33°. We saw no land and no open water, except narrow cracks, in any direction."

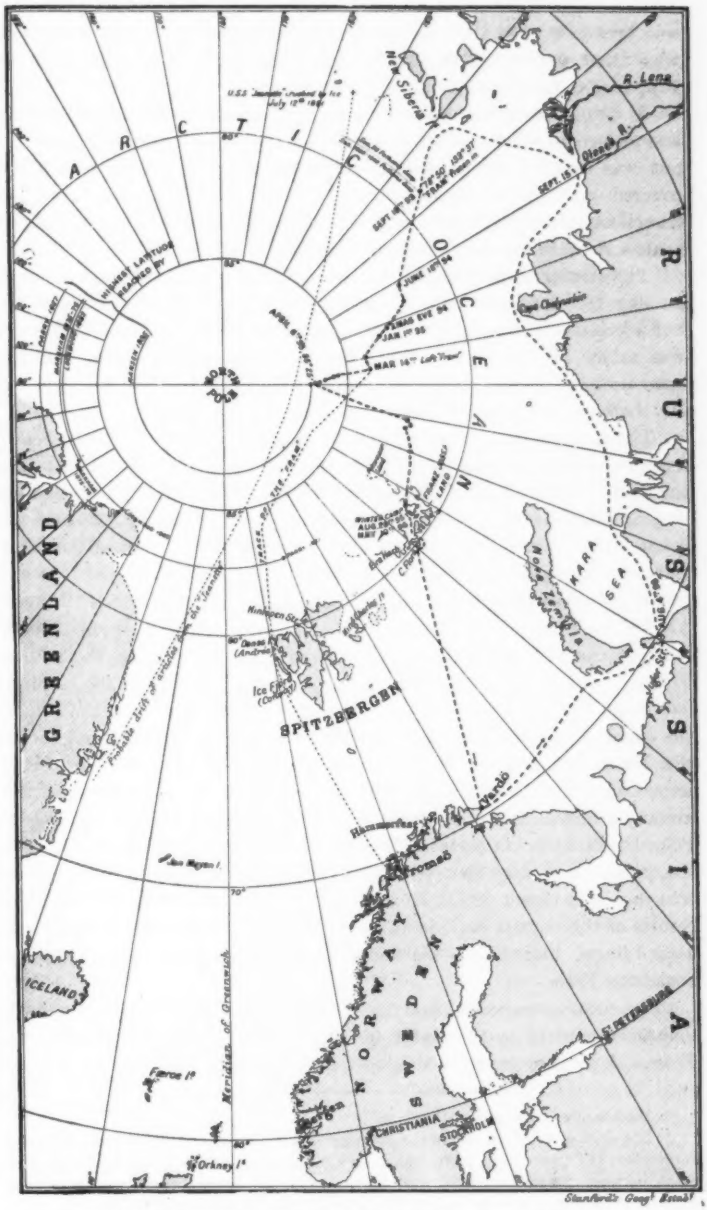
The north-westward drift was most rapid during the winter and spring, being counteracted or even reversed by northerly winds during

the summer. The highest northern latitude previously reached (83° 24′) was passed on Christmas Eve, 1894, and on March 3, 1895, 84° 4′ was attained. Very violent ice-pressures were experienced in January, when great ice-masses were pressed against the *Fram*, and threatened to bury, if not to crush her. It will be remembered that, to guard against the risk of crushing, the sides of the *Fram* were built at a very sloping angle, to facilitate the lifting of the ship on to the surface of the ice. In spite of the fears expressed by experts, that this could not take place when the ship was frozen firmly into the ice, the event justified Dr. Nansen's expectations, for the *Fram* was broken loose and slowly lifted out of her bed, showing not the slightest sign of a split in any part of her.

Feeling that the successful crossing of the Polar basin by the *Fram* was assured, and wishing to explore to the north of the probable route, which would, it seemed, lead a little to the north of Franz Josef land, Dr. Nansen left the ship on March 14, 1895, accompanied only by Lieut. Johannsen. The position then reached was 83° 59′ north, and 102° 27′ east of Greenwich. The travellers took three sledges, twenty-eight dogs, and two "kayaks," in case of open water. The northward progress was good for a time, but was soon hindered by rough ice and a contrary drift. The sledge had constantly to be carried across high hummocks of ice, and the advance was slow and fatiguing. The ice becoming still rougher, and an excursion northwards on *ski* revealing nothing but a constant succession of hummocks, the return march towards Franz Josef Land was begun on April 8. The most northern point reached was in 86° 14′. Temperature approaching 40° below zero had been experienced with little intermission for three weeks, causing much suffering to the travellers, who were clad only in woollen clothing, the fur suits having been left behind to save weight. No sign of land had been seen, and from the free movement of the ice (then drifting rapidly northwards), it appeared that there could be none within a long distance.

Progress southward was rendered very difficult by cracks, and the bad condition of the snow. Provisions fell very low, and one after another of the dogs had to be killed to provide food for the rest. During an unusually long day's march the chronometers ran down, and complete uncertainty prevailed as to the longitude. The looked-for land was long in appearing, but a seal and three bears were shot, by which a supply of meat was obtained. At last, on July 24, an unknown land was seen in about 82° north, and proved to consist of ice-capped islands,* which were only reached, however, on August 6, owing to the fact that the ice

* The explorer found it impossible to reconcile Payer's map with the results of his own observations, partly, no doubt, owing to his uncertainty as to his longitude. It seems certain, however, that the land east of Austria Sound is much less extensive than was thought by the Austrian voyager; but it must be remembered that his delineation of it was based upon distant views only.



SKETCH-MAP SHOWING DRIFT OF THE "FRAM" AND DR. NANSEN'S ROUTE.

was broken into small floes, while the crushed ice with which the water was filled prevented the use of the "kayaks." The longitude was supposed to be about 63° east.

It being too late in the season for the voyage to Spitzbergen, a spot was chosen as winter quarters in 81° 13′ north, and about 56° east. A hut was built of stones, earth, and moss, and roofed with walrus-hide, covered with snow. Bear-meat and blubber were the only food of the travellers, the latter supplying also the means of cooking, light, and heat, and bearskins forming their beds and sleeping-bag.

The winter having passed without mishap, a renewed start was made on May 19. Land extending westward was found a little south of 81°, but a broad sound leading southwards was followed. A westward course was taken as soon as the south side of the islands had been reached—open water permitting the use of the "kayaks"—and the meeting with Mr. Jackson took place a little south-east of Cape Flora.

The furthest point reached by Dr. Nansen is nearly three degrees of latitude (about 200 statute miles) in advance of that previously attained, the credit of which rested, as is well known, with Lieut. Lockwood and Serjeant Brainerd, of Greely's expedition, who reached 83° 24′.* So great an advance has not been made by a single expedition since Barents's voyages at the end of the sixteenth century, whilst it is only just equalled by the whole advance effected during the previous 120 years. At the time when Dr. Nansen left the *Fram*, nearly half the distance between the New Siberian islands and the north of Spitzbergen had been covered,† entirely by the help of the currents, on which the explorer had based the whole plan of his expedition. He is confident that, under the capable leadership of Captain Sverdrup, the rest of the passage across the North Polar basin will be safely accomplished, although it is improbable that a much higher latitude will be reached than that already attained before his departure. Although he has not reached the Pole, Dr. Nansen has certainly shown the way in which the crossing of the Polar basin may best be effected, and this, it is to be remembered, was the main object which he proposed to himself at the outset. The results of the voyage include valuable scientific observations relating to meteorology, magnetism, sea-temperature and salinity, etc., taken on board the *Fram*.

The most remarkable feat in the whole journey was undoubtedly that accomplished by the leader and Lieut. Johannsen, after leaving the *Fram*. A journey over the roughest of Polar ice, extending over eight

* Markham's furthest was 83° 20′ 26″.

† The drift of the *Jeannette* in the pack-ice east of the New Siberia islands, between September, 1879, and June, 1881, was, roughly speaking, about equal to that of the *Fram* between September, 1893, and March, 1895, but whereas the former was beset in about 71° north, the latter had already reached the high latitude of 78° 50′ before making fast to an ice-floe.

degrees of latitude (as it does if we add together the northward and southward sections of the route), with an insufficient supply of dogs, without fur clothing, or any of the comforts obtainable on board ship or in secure winter quarters, is, it may be said with confidence, unparalleled in the history of Arctic exploration, and shows once more the undaunted spirit and powers of endurance possessed by the explorer.

* * * * * *

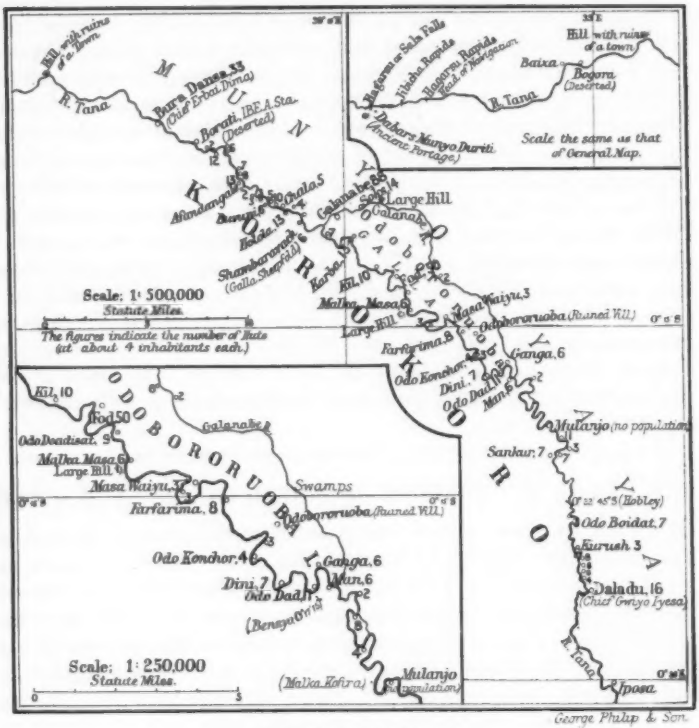
Since the above was written, the general satisfaction at the safety of Dr. Nansen has been enhanced by the additional news of the arrival of the *Fram* on the coast of Norway. Captain Sverdrup telegraphs the following details respecting the voyage. As had been anticipated, the *Fram* drifted north of Franz Josef Land, the highest latitude reached being 85° 57′. After a period of rapid movement, the ship remained stationary (in about 84° 9′ north, 15° east), from the end of February till the middle of July of the present year. From this position the *Fram* steamed through the ice, finally reaching open water north of Spitzbergen on August 12. The lowest temperature during the voyage was −52 C. (−62° Fahr.), and the highest +3° C. (+37½° Fahr.). The sea along the track maintained a depth of from 1800 to 2200 fathoms. No land was seen, and the ice took the form of broken hummocky masses, alternating with large fairly even floes. The result of the voyage thus supplies a striking proof of the correctness of Dr. Nansen's calculations.

THE REV. R. M. ORMEROD'S JOURNEYS ON THE TANA RIVER.

The Tana river was recently traversed from the coast to its highest navigable point, Hagarsu falls, by the Rev. R. M. Ormerod, of Golbanti, who was sent by his society, the United Methodist Free Church Mission, to ascertain the character and population of the various tribes on the river. None of the half-dozen travellers who had previously reached the falls seems to have taken pains to estimate the population, and no white man speaking the vernacular had reached Korokoro. Mr. Ormerod left his station (which is 30 miles from the mouth of the river) on August 19, 1895. For the first fortnight he had the advantage of travelling in company with two German missionaries (Messrs. Weber and Van Englen, of Ngao) on their kerosene-driven river-launch, the *Nagea*. But the river was almost at its lowest, and, owing to lack of water and the prevalence of dangerous snags, the launch could proceed no higher than Mavumbini, the chief town of the Subaki district. Thence Messrs. Weber and Van Englen returned. Betaking himself to canoes (dug-outs), which he had brought for the purpose, Mr. Ormerod resumed his up-river journey. He had eleven followers—six Pokomo canoemen, a Galla guide, a tentman, cook, and two boys. Three canoes were ample for the whole party and baggage.

Progress was slow, the stream being strong. Masa, the halfway town, was reached at the end of three weeks from the start; and Kidori, the highest town inhabited by the true Pokomo, was passed at the end of the fourth week.

From the river-mouth up to Kidori is locally called Pokomoni, "land of the Pokomos." The Gallas call it Chaffa. It is thickly



SKETCH-MAP OF KOROKORO.
(*By the Rev. R. M. Ormerod.*)

populated by a typically African race, who claim kinship with the Wanyika of the Mombasa and Melindi district. They are stalwart in physique, with chests well developed by the daily use of the paddle and punting-pole. The men are above the average height, the women often short and stumpy. Their complexions vary through all the shades from chocolate to black, the darker faces being seen the further inland one goes. Flat nosed, wide mouthed, with hair short and tatted, they have little facial resemblance to their Galla neighbours, to whom in most respects they are an inferior race. Their clothing

is scanty, especially with the young women (some of whom have a mere fig-leaf of a rag); but they besmear themselves with red paint and semsem oil—in some up-river places castor-oil. They are of mirthful, happy-go-lucky temperament; of timid disposition, and ignorant of the arts of war. In the Kinakombe district they carry bows and arrows for defensive purposes, but in most other places the spear used for killing hippos and crocodiles is their only weapon. They are much given to fetish-worship, witchcraft, funeral feasting, dancing, and drum-beating; and they drink honey-wine to such an extent as to become helplessly and dangerously intoxicated. Their chief occupation is the cultivation of rice, maize, bananas, peas, sugar-cane, and tobacco; but they plant little more than supplies their personal needs. Fish from the river, water-lily bulbs from the swamps, and white-collared monkeys from the woods are additional food-supplies; and in the higher districts they obtain much meat and occasionally an ivory tusk in game-pits and snares. They divide their land into districts, each stretching a day's journey or more along the river. Each district has its chief town, the centre of administration where lives the chief or "sultan," and thither he calls the elders of the smaller towns whenever "affairs of state" require it. The "sultan" of Subaki refused to supply Mr. Ormerod with canoes or men, assigning as the reason that it was his custom to hinder all Europeans, Arabs, and Swahilis from passing up-river.

The largest town in Pokomoni is Kosi, the capital of the Ndera district. Its population is about 700. Kinakombe, Mikameni, and Ngao (German mission-station), are other large towns. There are altogether about 15,000 Pokomos scattered along 250 miles of winding river-course.

Manyole, the land stretching for 60 miles above Kidori, is practically a no-man's land. Mr. Ormerod travelled in it for seven days through almost unbroken forest. Only here and there, at eight different points, a few bushmen were clustered in the forest fringing the river-side.* Their total number he reckoned at 240. They call themselves "Wata;" the Swahilis call them Wasanya, or Waboni. These alternative names, used by the Swahilis, imply a slight distinction, which the Wata themselves do not pay attention to. The Wasanya live mostly on the river, and speak only Kigalla; the Waboni live out in the bush, and have an alternative language, the Kiboni. This Kiboni language they speak of as "the lost Wata tongue." These Wata are all serfs of the Gallas, and use the Galla language. Their chief, Lubo, live at a cluster of five huts called Manyole. He told Mr.

* These villages of the Wasanya, with distances from Kidori in miles, are: Manycle (17 miles), Kakatea (23 miles), Kumude (35 miles), Worable (37 miles), Holola (39 miles), Odo Tesoa (50 miles), Kolati (53 miles), and Iposa (61 miles, and 8 miles below Deladu, the first village of Korokoro).

Ormerod that there is not so much game as formerly, and they have found it necessary to turn their hands to agriculture. They still look to hunting for their staple food-supply, but cultivate maize and a little rice, collect honey, and eke out with water-lily bulbs and wild fruit. Their huts are exceedingly small, merely a few fan-palm fronds stretched over half a dozen bent boughs. Each is barely sufficient to shelter the owner's wife; he and his children sleep outside under the shady trees.

Mr. Ormerod entered Korokoro five weeks from the start, and found himself among a race identical to the Pokomos on the lower river, in every respect except language. They speak only the Galla tongue, and call themselves "Munyo Yaya." Undoubtedly they are Pokomos who, by long separation from their more numerous brethren down-river and long servitude to the Gallas, have been led to abandon their mother-tongue and adopt that of their masters. There are still friendly relations between them and the Pokomos of Masa, Tuni, Bura, and Kidori. Kidori people of marriageable age often go up to Korokoro to seek husbands or wives, and, after staying a few years, return to Pokomoni. The children thus born in Korokoro speak only Kigalla, and have to pick up Kipokomo in later years. There is also some ivory trade between the people of Korokoro and the Pokomos, the Pokomos subsequently selling the tusks to Arabs and Swahilis from the coast.

The total number of the Munyo Yaya is 1500. Their hamlets are dotted along the river-banks for a distance of 100 miles. They have two chiefs: Gwiyo Iyesa and Erbai Dima, both very old and of insignificant appearance. Gwiyo lives at Daladu, the lowest town but one; and Erbai at Bura Dansa, the highest town. A funeral dance was in progress when Mr. Ormerod arrived at Daladu. The old chief and all his people—men, women, and children—were more or less intoxicated. The chief asked Mr. Ormerod to move his tent across river, lest some of the revellers should "run amuck" and molest the stranger. As the night advanced the dance became "fast and furious," and one man had his forehead gashed with a brass amulet, but Mr. Ormerod was not disturbed. Next day (Sunday) Mr. Ormerod tested their knowledge of the supernatural. Their religion seems to be a mixture of fetishism and pantheism. They appear to have no idea of a Personal Creator. On being told of the Divine Being, they exclaimed, "Well, He must be a white man!" Mr. Ormerod described the work and teaching of Jesus Christ, and asked if they had ever heard of such a being. They replied, "Yes; you refer to our chief, Gwiyo Iyesa."

The Galla settlements on the island of Odobororuoba Mr. Ormerod found three days above Daladu. The island is a low strip of land on the left bank of the river, enclosed by a branch stream which forks off at Galanabe and re-enters at Ganga. It is about 15 miles long, and 4 or

5 miles broad. None of it is more than a foot or two above flood-level. The branch stream (called the Galanabe stream), which encloses the island on the north and east, loses itself in swamps, where Mr. Ormerod found mosquitos buzzing about at mid-day. There were thousands of whistling snakes, evidently migrants from the rice districts on the lower Tana. The Gallas live on the island of Odobororuoba because of the protection it offers from the Wakamba and Somalis. They are settled in six towns, all close to the Tana river. The largest, Galanabe, contains about 350 people. All six towns contain perhaps 700 people—not more. Of these many are obliged to remove to the mainland during the flood season. They settle at such times on high land to the north, where they live in constant terror of Masai and Somalis. These 700 Gallas hold the 1500 river-people (Munyo Yaya) in subjection. They have large flocks of sheep, a few cows (taken in raids against Wakamba), and some donkeys (taken from Masai); but they also help themselves to the Indian corn, peas, and honey, and even ivory of the Munyo Yaya. The young Gallas go elephant-hunting at certain seasons, but raiding seems to be an almost equally familiar occupation. They march as far as twenty days away to attack Masai villages, and claim to have gone as far as Kenya in war against Wakamba. The Rhendile and Borana peoples they regard as enemies, although originally of one stock, and they have no intercourse with them.

The Gallas have two chiefs—"landowners," they call them—but they acknowledge Dadi Aba Dada, of Bomapande, on the coast near Melindi, as their king. Of the two "landowners," Mr. Ormerod found Sade Ramatha pleasant and talkative—evidently pleased to converse in his own language with a white man. He spoke respectfully of all the explorers who had visited Odobororuoba except Dr. Peters, whose sudden attack upon their sleeping town he regarded as inexplicable. Nor could he understand why the promises, made by the I.B.E.A. Company on taking over the land, to establish a garrison for its protection had never been fulfilled. Galgalo Dalenoa, the younger chief, lives at Galanabe, the northernmost town on Odobororuoba island.

This point was reached at the end of the sixth week, halts of a day each having been made at several of the Galla towns. At each town—Farfarima, Fod, and Galanabe—the Galla elders solemnly accused the down-river Pokomos of having bewitched Odobororuoba. "Once," they said, "we had no beasts of prey. But two years ago, when Sir Gerald Portal passed this way, seventy Pokomos came up here to paddle him down-stream. One or two were disagreeable. They bewitched our land; and from the very day of their departure we have been constantly troubled with lions, leopards, and hyenas. On returning to the coast, please catch these men—their names are so-and-so—and make them withdraw their evil spell." They repeatedly threatened to kill the Pokomos who accompanied Mr. Ormerod. The Gallas themselves are

little addicted to witchcraft, but they greatly fear the Pokomo "doctors."

From Galanabe Mr. Ormerod proceeded further up-stream. Nine hours' paddling took him to the I.B.E.A. Company's old station, built by the "Kenya" expedition—called "Balarti" in the map published in the *R.G.S. Journal* of August, 1892, but known to the natives as "Borati." The house was in good order, but the stockade almost entirely broken down. There is no population in the vicinity, both river-people and Gallas being afraid of the Somalis, who come hunting across the high pastoral plains behind. An hour and a half's journey higher the last town on the river was reached, Bura Dansa. It is inhabited by Munyo Yaya, who until recently lived at Baiza or Bogore. Erbai Dima, a short, shrivelled old man, is the chief of this outpost of population in the Tana valley. He presented the party with flesh of a giraffe caught in his game-pits, and mentioned that a young rhinoceros had been found in another pit. Evidently game-snaring and trapping is one of the chief pursuits of the Korokoro people.

Paddling for nine hours above Bura Dansa, the party reached Hagarsu falls — the highest point attainable by canoe-travel — at the end of the seventh week from the start. Mr. Ormerod was disappointed with the falls. A series of three shallow ledges of rock bar the river at intervals of half a mile apart. With the river in flood, these may be crossed by expert canoeists. Above these, at a point called Sala, are the falls. For one half of the river there is a clear drop of about 15 feet; the other (northern) half is a somewhat gently sloping cataract, where monster crocodiles lie, head out of water, basking in the sun. The native name for the falls is Dabars Munyo Duriti, "the place which the ancient river-people used to pass." In olden times, they say, the river-people used to carry their canoes overland past the falls, and thus continue their journeys further up-river. Hence the name. Climbing the hills south of the falls, Mr. Ormerod had a good view of the range of hills which makes a pleasing panorama along the western horizon. Rising in the rear of these, bearing 283° by prismatic compass, was the dome-like head of a mountain, which the natives called Meru. This seems to be a name for the Kenya range; and the Gallas mentioned that, when raiding in Kamba-land, they had sometimes seen snow glistening on this mountain. But to Mr. Ormerod the peak appeared to be dark—even darker than the other heights in the neighbourhood.*

Mr. Ormerod camped in one of the numerous islets in midstream below the falls. There he spent a Sunday. In the afternoon he walked for three hours in the dense scrub which stretched league upon league northwards. Curiously enough, Dr. Donaldson Smith's expedition, marching to the Tana from the Rhendile country, was close at hand,

* The peak seen was certainly the Kenya, but Meru is the name of a district about 30 miles to the north of it.—Ed.

but neither party suspected the other's presence in the vicinity. That night the island camp was disturbed by hippos, which were put to flight with a few rifle-cracks.

The homeward journey began on October 7; and at Bura Dansa Mr. Ormerod had the pleasant surprise of meeting Dr. Donaldson Smith and Mr. Dodson, just arrived from their gallant march through North-East Africa. He had the privilege of travelling down-stream with them. They paddled rapidly, in order to keep pace with Dr. Smith's camels, which were making quick marches through the bush. Some days they paddled twelve hours at a stretch. At Ndera Dr. Smith's party left the river, marching overland to Lamu. Mr. Ormerod kept to the river, and reached Golbanti on the 25th. His canoes did the whole journey from Hagarsu falls to Kau, on the Ozi river (practically the coast), in twenty-one days.

Mr. Ormerod's journey supplies data for reckoning the rate and value of canoe-travelling and transport—the quickest and cheapest mode on the Tana. From Kau, on the Ozi river (to which dhows run from Lamu), to the Hagarsu falls entails two hundred and thirteen hours of canoe-travel. This, at five and a half hours a day (Mr. Ormerod's average), takes thirty-nine days. Mr. Ormerod made Sunday halts, and spent odd days in food-collecting. The return journey, excluding halts, occupied fifteen days. Canoeing against the stream averages 2 miles an hour; with the stream, 4 miles. By the use of relays of canoeists, the up-stream journey could be done in almost half the time. A canoe, manned by two Pokomos (wage $6 a month and rice allowance), is capable of carrying 8 cwt. of burdens.

The total population on the Tana river seems to be 18,000 or 19,000, made up as follows:—

Pokomos (on lower Tana)	15,000
Gallas " "	1,000
Wasanya (Manyole)	300
Gallas (Korokoro)	700
Munyo Yaya (Korokoro)	1,500
	18,500

This estimate is based upon a careful census of the huts in all the towns, and is therefore reliable. Previous travellers, reckoning by mere generalizations, have put the population as high as 60,000.

On returning to Golbanti, Mr. Ormerod extended his journey so as to take in the several settlements of Gallas near the coast. This entailed three weeks' travelling, mostly on foot. At Witu he found a settlement of 420 Gallas; at Kitumbini, 60; at Bomapande (two hours' walk inland from Mambrui), 468; and on the Sabaki river (two days from the mouth), 672—a total of 1620. This, added to the figures already given for the lower Tana and Korokoro districts, makes the total Gala (Bararetta) population in East Africa (not including such as

are living in Somali or Swahili slavery, or are otherwise dispersed) at 3300. After three years' life among the Gallas, Mr. Ormerod feels certain that this estimate is about right. It is certainly not below the mark. The Gallas are but a shadow of their former selves. They have never recovered from the disasters wrought by the Somali invasion twenty years ago; and, deprived of their cattle by repeated plagues, many have succumbed to hunger and want. They are intensely conservative, and, as a whole, refuse all instruction and advice from the intruding white man. It remains to be seen whether, by a continuance in their foolish exclusiveness, they will die out before the advance of civilization, or, by accepting the teaching and arts of the European, they will resuscitate and regain somewhat of their former greatness.

The MAP illustrating this article is copied from a manuscript received from the Rev. R. M. Ormerod. The point at which Lieut. Höhnel made his observations (lat. 0° 7′ 20″ S., long. 39° 8′ 42″ E.) is supposed to be identical with Borati, the deserted station of the British East Africa Company; whilst Mr. Hobley (see the map in the *Proceedings*, 1892) seems to have observed higher up on the river, the position determined by him agreeing with the "Hill with ruins of a town" on the map before us. Other latitudes accepted are those for Benayo (0° 17′ 15″ S., Höhnel), and Mr. Hobley's camp of June 23 (0° 22′ 45″ S.).

THE INTERNATIONAL GEOGRAPHICAL CONGRESS OF 1895.

THE publication of the *Report* of the Sixth International Geographical Congress may be looked upon as the conclusion of the matter so far as the visit to London is concerned. But the Congress is no longer in the position of a "new star" appearing in the scientific firmament without reference to the past or the future; it has acquired permanency, and, while coming into periodical prominence in different parts of the Earth, it remains in existence so far as its governing body or Bureau is concerned, and it may thus be looked on in a sense as a new and international geographical society. The rule that after each meeting the Bureau elected at or for that meeting continues to act until its successor is appointed, virtually confers special powers and special responsibilities in turn upon the chief geographical society of the countries offering hospitality to the Congress.

The first care of the present Bureau has been to produce the *Report* as speedily as was practicable, having regard to the trouble necessary to ensure correctness in the printing of the four languages employed; and the second was to present the volume in a form which should render it an acceptable memento of the Congress. The *Report* is a royal octavo volume uniform in style with the *Geographical Journal*, but containing about 1100 pages, and bound in olive-green cloth.

Its contents fall into four divisions—an Introduction of 30 pages,

giving a complete diary of the proceedings of the Congress, both scientific and social; the papers which were read, printed in the language in which they were received, and accompanied by an abstract of the discussion which was specially reported, in all occupying 800 pages; and as appendices the full List of Members with revised addresses (84 pages), and the Catalogue (190 pages) of the geographical exhibition.

According to languages, the papers published number in English 50, in French 27, in German 7, and in Italian 2; but according to the nationality of the authors, the order is, British 26, French 21, German 9, Swiss 7, Italians 5, United States 4, Sweden and Norway 4, Austro-Hungarian 4, Russian 3, Chilian 1, Dutch 1, Portuguese 1:—total 86. Thus it appears that of the papers printed in English only one-half were contributed by British subjects, the remainder being by Americans and by foreigners, who preferred to appeal to the larger part of the audience at the meetings, who understood English only. The Congress was attended altogether by 1552 members, of whom 950 were Fellows of the Royal Geographical Society, and 451 were foreign members, 72 of whom were appointed to represent 30 foreign governments, and 189 were appointed to represent 70 geographical societies and 20 societies of kindred aims in all parts of the world.

Attention may be drawn to some of the more important discussions which are reported in the volume. Of these the first was that on geographical education, introduced by an exhaustive paper on the whole question as exemplified in France by Professor Levasseur, and followed by papers by Professor Lehmann and Mr. Herbertson. Then follow the discussions on polar exploration, introduced for the Antarctic by Professor Neumayer, and for the Arctic regions by Admiral Markham. Papers on geodetic subjects were introduced by the late General Walker, whose treatise on the Geodetic Survey of India, accompanied by a map, is one of the most valuable contributions to the *Report*. For interest in a practical sense, the discussion on the climate of Africa and the suitability of that continent for development by Europeans will long retain its value. The importance of having papers by such pioneers in African exploration as Sir John Kirk, Mr. H. M. Stanley, and Count Pfeil brought together, is not likely to be underestimated. It is unnecessary to prolong this notice by recapitulating the remarks of Sir Clements Markham, which are given in his anniversary address to the Society (*Geographical Journal*, vol. viii., July, 1896, p. 1), but it may be useful to append the following summary of the Resolutions passed by the Congress and remitted to the Bureau for consideration and execution as far as it may be found possible:—

1. The Bureau of the Congress.

That the officers of each Congress continue to act until the organization of the following Congress, in order—

(1) To carry out as far as possible the resolutions of the last Congress;

(2) To keep up relations with the special committees which may be appointed;

(3) To communicate with the Organizing Committee of the following Congress regarding all questions pending;

(4) To present to the following Congress a report on the work done in the interval.

2. Periodical Geographical Literature.

That the Congress deems it desirable that greater facilities be provided for the purchase of periodical literature devoted to geography. It is therefore recommended to societies and other publishers of geographical periodicals, that they print in their publications the price of annual subscription, and of single and supplementary numbers, including postage, giving rates both for the country of publication and the countries in the Postal Union.

That the President appoint a Committee of one respectfully to communicate this recommendation to the societies and other publishers of geographical periodicals; and the Committee be requested to obtain from these societies and publishers, as far as practicable, the desired information, to collate it, and to send, as early as possible, a copy of this price list of periodicals to the various publications, in the hope that it may thus receive wide publicity.

That the Committee be requested thoroughly to revise and promulgate this list annually as far as may be done in the manner above described, until the meeting of the Seventh International Geographical Congress.

3. Antarctic Exploration.

That the Congress record its opinion that the exploration of the Antarctic Regions is the greatest piece of geographical exploration still to be undertaken. That, in view of the additions to knowledge in almost every branch of science which would result from such a scientific exploration, the Congress recommends that the scientific societies throughout the world should urge, in whatever way seems to them most effective, that this work should be undertaken before the close of the century.

4. Geographical Bibliography.

That the Permanent Bureau of the Congress should follow out the study of geographical bibliography; and that it be authorized to associate with itself competent persons, and to give them the necessary powers for prosecuting the inquiry.

5. International Geodetic Association.

That the Congress expresses the opinion that all civilized countries which have not yet joined the International Geodetic Association should be invited to do so.

7. Topographical Survey of Africa.

That it is desirable to bring to the notice of the Geographical Societies interested in Africa the advantages to be gained—

(1) By the execution of accurate topographical surveys, based on a sufficient triangulation, of the districts in Africa suitable for colonization by Europeans.

(2) By encouraging travellers to sketch areas rather than mere routes.

(3) By the information and publication of a list of all the places in unsurveyed Africa which have been accurately determined by astronomical observations, with explanations of the methods employed.

(4) By the accurate determination of the position of many of the most important places in unsurveyed Africa, for which operation the lines of telegraph already erected, or in course of erection, afford so great facilities.

8. Map of the World; Scale 1 : 1,000,000.

That the following resolutions drawn up by the Commission appointed at the Fifth Congress relative to the preparation of a map of the World, on the scale of 1 : 1,000,000, be adopted by the Congress :—

(1) The Commission has received the Report of the Berne Committee, and feels grateful for the work done by it.

(2) The Commission declares the production of a map of the world to be exceedingly desirable.

(3) A scale of 1 : 1,000,000 is recommended as being more especially suited for that purpose.

(4) The Commission recommends that each sheet of the map be bounded by arcs of parallels and of meridians. A poly-conical projection is the only one which is deserving of consideration. Each sheet of the map should embrace 4° of latitude and 6° of longitude up to 60° north, and 12° of longitude beyond that parallel.

(5) The Commission recommends unanimously that the meridian of Greenwich and the metre be accepted for this map.

(6) The Commission recommends governments, institutions, and societies, who may publish maps, to accept the scale recommended.

(7) The Commission lays down its mandate, and recommends that the Permanent Bureau of the Congress be charged with the duty of carrying on its work, and be authorized to co-opt for this purpose scientific men representing various countries.

9. International Cartographic Association.

That the Congress considers that those countries which have not published graphic catalogues of maps should be invited to do so, and that geographical societies be recommended to interest themselves in the matter.

10. Hydrographic Research in the Baltic, North Sea, and North Atlantic.

That the Congress recognizes the scientific and economic importance of the results of recent physical and chemical research in the Baltic, the North Sea, and the North Atlantic, especially with regard to fishing interests, and records its opinion that the survey of these areas should be continued and extended by the co-operation of the different nationalities concerned, on the lines of the scheme presented to the Congress by Prof. Pettersson.

11. Seismic Observations.

That the Congress acknowledges the utility, and, indeed, the scientific necessity, of an international system of stations for the observation of earthquakes.

12. Geographical Education in Great Britain.

That, the attention of this International Congress having been drawn by the British members to the educational efforts being made by the British Geographical Societies, the Congress desires to express its hearty sympathy with such efforts, and to place on record its opinion that in every country provision should be made for higher education in geography, either in the universities or otherwise.

13. Geographical Orthography.

That the various Geographical Societies be requested to study the question of arriving at some agreement as to the writing of foreign names, and to prepare reports for the next Congress.

14. Geographical Bibliography.

That this Congress expresses its approval of the principle of State-printed Registration of Literature as the true foundation of National and International Bibliography, and approves the appointment of an International Committee to further the said object, the constitution of the Committee to rest with the Bureau of the International Geographical Congress.

16. Dating of Maps.

That the Congress put on record its opinion that all geographical maps should bear the date of their completion, in order to obviate the errors which would otherwise be apt to arise.

17. Decimal Division of Angles and Time.

That the Congress request the Geographical Societies represented at it to consider the question of the application of the decimal system to angular and time measurements, and to report on the subject to the next Congress.

18. Duties of the Bureau of the Congress.

That the Committee of each International Geographical Congress be charged—

(1) To print and circulate to all Geographical Societies a list of the notes and resolutions carried at the preceding Congresses.

(2) To request each geographical society to send in a short report on the progress made in their country on the subjects referred to.

(3) To appoint a reporter to the next Congress, who shall submit a general summary of progress made in the subjects considered.

THE MONTHLY RECORD.

EUROPE.

The Sea Approaches to the Mersey.—Lieut. Mark Sweney, I.N., contributes to the Literary and Philosophical Society of Liverpool an interesting historical sketch, with charts, of the changes which have taken place at the mouth of the Mersey since the date of the first recorded survey; and although the chief importance of the paper is from the point of view of navigation, it nevertheless illustrates in a striking manner the progressive action of a river, and affords an opportunity for detailed study of river work. The first known survey of the Mersey was executed in 1689 by Captain Grenville Collins, R.N., Hydrographer to his Majesty King William III., and the chart, which shows two channels, the Farmley and the Horse channel, was published in 1693. At this period Hoylake was a recognized anchorage, and here William III. embarked for Ireland in 1690, hence the King's Gap road, now leading to the shore at Hoylake. The old Liverpool dock was opened in 1700, and finally closed in 1826, when its site was filled up and the present Custom-house erected thereon. The next survey was made in 1736–7, by Messrs. Fearon and Eyes; and in 1767 an amended edition of their chart was issued, showing four lights on the Cheshire shore, two at Hoylake and two at Leasowe, the first in which the catoptric mirrors invented by William Hutchinson, water-bailiff, were introduced. Another survey, by M. Mackenzie, 1771, shows the

Farmley, Rock, and Horse channels, buoyed after the method recently adopted as a uniform system by all maritime countries. In 1833 Lieut. Denham, R.N., afterwards Sir H. M. Denham, was, at the request of the port authorities, detailed from the survey of the British Channel to survey the channels of Liverpool bay. This resulted in the discovery of a new channel, which was opened for navigation, but in 1837 showed signs of deterioration, and had to be closed in 1838. Captain Denham was retained by the Dock Committee as first marine surveyor to the port, and he inaugurated annual surveys of Liverpool bay, so that from his time onward a constant record exists of every change which has taken place, from natural or artificial causes, over the whole area right up to the upper estuary.

Flatey and the Codex Flateyensis.—Flatey ("flat island") is the name of two small islands off the coast of Iceland, one in the north, and one in the west. The northern one is somewhat the larger, and accordingly is to be found "conscientiously inserted" on most of our maps; but Prof. Rein writes to *Petermanns Mitteilungen* (1896, No. 6) to point out that the other, though only about an English mile in circumference, is by much the more important. It is the historically celebrated Flatey, and yet, he adds, with the exception of the latest edition of Stieler's Handatlas, we as a rule search for it in vain on our maps. Nevertheless, it may be mentioned that Prof. Rein might have found it, not only on the last map of Iceland in the *Geographical Journal* (vol. iii. p. 256), but also on that in the *Proceedings*, 1882, p. 192, and that in the old series of the *Journal*, vol. xlvi. p. 1. This Flatey is the Breidifjördur (pronounced *Breidifjördr*, says Prof. Rein), and is a member of an archipelago of small low islands, several of which, besides Flatey, are inhabited. Small as it is, it has a church and several farms, and also "the most beautiful harbour in the world" (Olaf and Tovels, p. 617). It is to this harbour that it owes its celebrity. Thence sailed the expeditions that settled Greenland in 983, and discovered the mainland of North America half a millennium before Columbus. From this island was also obtained the 'Codex Flateyensis,' or 'Flateyjarbók,' containing, among other things, the records of these discoveries. This manuscript was bought in the seventeenth century by Bishop Brynjálfur Sveinsson for King Frederick III. from a peasant of Flatey, which at the present day is a small trading-place with 150 inhabitants.

Levelling and Sea-level Observations on the Swedish Coasts.—Mr. P. G. Rosen gives in *Ymer* (vol. xvi. p. 65) an account of the recent levelling operations and observations on sea-level changes on the Swedish coasts. The levelling operations, which commenced in 1886, have now reached such a stage that the work in Southern and Central Sweden may be considered as nearly finished, only a few control-measurements remaining. In Northern Sweden, also, a considerable part of the work has been done, and it is hoped that by 1898 the entire levelling and necessary calculations will be finished. The entire distance levelled in Southern Sweden is 1726 miles; that in Central and Northern Sweden has not yet been made public. The observations on the change of sea-level commenced as far back as 1759, and were continued, with certain interruptions, down to 1852. From the latter year until 1875 another series of observations was made, the results of which were published by Dr. Forssman in *K. Akad. Handlingar* (vol. xiii. No. 11). In 1887 a new series of observations was commenced at seven stations with self-registering level-gauges, and at four stations with level-gauges to be read by scale. The results obtained from the earlier and more recent observations can be summarized thus: (1) The periodical changes of level in the Baltic and Kattegat, which arise from climatological causes, such as temperature and precipitation, are very constant. The only perceptible variation is in the Gulf of Bothnia, and is caused by the more plentiful and uneven inflow of water which takes place in this part of the sea. (2) The local variations,

caused by currents and winds, are, as in other parts of the Baltic, very considerable. Their amplitude reaches 18 inches, whereas the difference between the highest and lowest sea-level on the German Baltic coast is nearly the same, namely, 18½ inches. (3) Neither the Baltic nor Kattegat, along the Swedish coast, has a constant mean level. The changes are partly secular, partly periodical. (4) The mean level of the Baltic is about 7½ inches higher than that of the Kattegat. In conclusion, the author remarks that a speedy connection with the results obtained in adjoining countries is very desirable. With Denmark, across the narrowest part of the sound, it will take place during the present summer; and with Norway, at Christiania and Trondhjem, in the near future.

ASIA.

Captain Deasy's Expedition in Central Asia.—We have received, through Captain E. J. Swayne, some details respecting the plan of the journey undertaken by Captain H. H. Deasy, 16th Lancers, from Ladak towards the frontier of China. In the hope of establishing the identity of the chief rivers crossed by him *en route*, flowing to the Brahmaputra, Salwin, and Mekong, he intends to throw into them soldered-up tins containing parchment notices numbered consecutively, and marked on the outside with a brass label (size 2 inches by 1¼ inch) requesting the finder to open. The parchments are to be forwarded to the Royal Geographical Society. Captain Deasy asks us to express on his behalf the request that the officials in the neighbourhood of the rivers alluded to will arrange that a look-out for these tins may be kept. He was already in Ladak early in June last, and will endeavour to reach Batang in China by the end of December.

French Commercial Mission to China.—We have received the following details respecting the "Mission Lyonnaise d'Exploration Commerciale en Chine," now pursuing its operations in that country: The party consists of Consul Émile Rocher as chief, M. Brenier, secretary, and ten others. Five of these represent the Chambers of Commerce of Lyons, Marseilles, and other towns, and there are also two experts in silk, a mining engineer, a doctor, etc. On reaching Yunnan-fu from Lao-kai, they were to split into two parties, one proceeding north to Cheng-tu, the other north-east to Chung-king, where they were again to unite, and where some of the members will probably remain until the autumn.

Discovery of Lake Poso in Celebes.—It has been stated that the first European to visit this lake, whose exploration by the cousins Sarasin is mentioned on p. 205 of vol. vii. of the *Journal*, was the Rev. A. C. Kruijt, a Dutch missionary, who reached it in 1893; but Dr. Wichmann writes to *Petermanns Mitteilungen* (No. 7, 1896), to state that he has ascertained by correspondence that it was actually first visited by Jonkheer van der Wijck, a Dutch official, in 1864, and again by the present Governor Michielsen in 1869. Dr. Wichmann adds some notes about the lake communicated to him by the Rev. Mr. Kruijt, and some observations on the geology of the neighbourhood.

AFRICA.

The New Road to Uganda.—At the date of his last letters (May 24, 1896), Captain Sclater, R.E., F.R.G.S., who is engaged, under orders from the Foreign Office, in improving the communications between Mombasa and Uganda, was at Kamsikak, halfway between the Eldoma ravine and Mumia's, in the Nandi country, through which he proposed to carry a shorter route than the track usually adopted, which lies far to the right. In Nandi it is intended to establish a new station, of which Mr. Foakes, of the Uganda Administration, will be placed in charge as soon as the new route is open. From Eldoma the new route follows the old one for two days'

journey, and then turns off from it a little south of west, and reaches Kamsikak in three days more. After leaving the old route the new road passes through a hilly district, traversed by many streams and varied by beautiful cedar forests. It is described as a very fine country, lying from 8000 to 10,000 feet above the sea-level but quite uninhabited. The game-animals met with were principally Jackson's hartebeest (*Bubalis Jacksoni*), and one of the reed bucks (probably *Cervicapra bohor*). There was still a great deal of work to be done on this part of the new Uganda road, and local labour was scarce. Captain Sclater did not expect to get through to the lake before September.

The Sand-dunes of the Sahara.—M. Paul Privat-Deschanel contributes a letter to the *Revue Scientifique* on the successful experiments made at Aïn-Sefra during the last few years with the view of fixing the sand-dunes on the borders of the Sahara. It was found that a considerable number of plants could derive sufficient nourishment from the sand to keep them alive, and that the method successfully employed in the Landes was available, provided some means could be discovered of giving the plants time to establish themselves before the sand either overwhelmed them or left their roots altogether bare. M. Golron, chief of the Arab department at Aïn-Sefra, hit upon the plan of covering large areas with litter composed of Alfa grass, and in two years was successful in reclaiming 120 acres. The species of plants which flourish best on the sand thus fixed are the Barbary fig, peach, aspen, etc., which, curiously enough, give much better results than the tamarisk or plane tree or the acacia, suggested by the Forestry Department.

The Origin of Lake Tanganyika.—In two articles contributed to the *Mouvement Géographique*, M. Jules Cornet contests the theory that Lake Tanganyika is an old arm of the sea, a "Relicten-See" according to the German terminology. Although the most obvious explanation of the presence of organisms of apparently marine type in the lake, M. Cornet thinks it not the only or the most probable way of accounting for the facts observed. The present character of the shells is, in his opinion, the result of adaptation to environment, for the vast size of the lake brings about a certain resemblance to the conditions of life in the ocean, notably as regards its liability to storms, by which delicate shells would be shattered. With regard to the Medusæ, whose presence seems at first sight more difficult to account for, he points out that they exist in other waters which have no communication with the sea, being found, among other places, at Bámako, on the Niger. On the other hand, if we look at the fish of the lake, we find they are fresh-water forms occurring equally in the Congo, Nile, etc. The absence of deposits with traces of marine organisms over the whole of Central Africa is another strong argument against the idea of the marine origin of the lake, which is much more probably due to the great Earth-movements, which, as Prof. Suess has shown, have had such a potent influence in the region in question.

AMERICA.

Venezuela.*—This account of a second visit to the country forms the twelfth volume of the 'Mittheilungen der Geographischen Gesellschaft in Hamburg.' The Society gave the author, who is Professor of Geography at Giessen, the sum of 10,000 marks in order to enable him to supplement the observations taken by him in 1884–85. The journey occupied about nine months, and the results are published by the Hamburg Society. The most interesting part of the book is an account of the political troubles in this somewhat turbulent republic between 1892 and 1893.

* 'Zweite Reise in Venezuela in den Jahren 1892–93.' By Dr. W. Sievers. Hamburg, 1896.

Though this chapter has been written solely with a view to showing the difficulties experienced by the author, it none the less gives a very clear idea of Venezuelan character and the extremely unstable state of its former government. The remainder of the book contains a short chapter on the commercial prostration which followed the civil war; this is entirely descriptive, and without much practical bearing. Another chapter is devoted to the heavy rains and damage produced by them in the same year, 1892–93, and this is followed by the full account of his observations and travels. The following five provinces were visited, and are described in separate divisions: (1) The peninsula of Paraguana; (2) Coro and Barquisimeto; (3) the Karibi mountains; (4) the Llanos; and (5) Guayana. The information given is extraordinarily copious and detailed. It can be best described as an attempt to write in words a large-scale geographical and physical map. There are scattered botanical notes, and also at the end of each division or subdivision, an estimate of the population of every hamlet and town, which is based upon data of which Dr. Sievers does not give any clue, it is impossible to judge. The geology is of a very detailed character, without any attempt to give a general account (the quotations from Humboldt's travels are far more clear than those due to Dr. Sievers himself); but there is scarcely anything about the precious metals. It is scarcely possible to resist the conclusion that so careful a worker would have had more to say on gold and copper, and, as also in the case of his notes on trade and commerce, we can only suppose that these interesting points have been designedly left out. But the absence of a map and index robs the whole work of interest and importance. These 287 laboured pages might be of use to a trained geologist visiting the country, to the senior staff officer of an invading army, or to a map-maker of more than the average patience and industry. There is no complete bibliography, but the copious references to Codazzi, Karsten, etc., render it difficult to tell how much of the work is original. A discrepancy is pointed out between Codazzi's atlas and the English charts of the Gulf of Coro and island of Chicaqua. There is also a long list of altitudes calculated mainly by aneroid barometer.

River Navigation in Venezuela.—To the July number of *Petermanns Mitteilungen*, 1896, Prof. Sievers contributes a second map of Venezuela (see under new maps). In the accompanying text he furnishes, in addition to notes on the hypsometry of the country, some particulars as to the means of communication, including the river navigation. The only two river systems that are used for navigation are those of the Orinoco and the Catatumbo. Every fortnight a steamer of the Royal Mail Steamship Company runs between Port of Spain, Trinidad, and Ciudad Bolívar, making use of the Macarea arm of the Orinoco delta (an arm flowing northwards to the neighbourhood of the Serpent's Mouth). The voyage takes about thirty hours down, and thirty-six hours up stream. During the rainy season (May to November, rarely as late as December) smaller steamers connect Ciudad Bolívar with the western llanos, ascending to Nutrias on the middle Apure. There is no regular navigation on the upper Orinoco above Caicara (confluence of the Apure), but steamers ascend as occasion requires to various places below the rapids of Atures. River-steamers ascend the Catatumbo-Zulia to Puerto Villamizar, and from the mouth of the Zulia a smaller steamer ascends the Escalante to Santa Bárbara, the starting-point of the railway to La Vejia, at the foot of the Cordillera de Mérida.

British Columbia: Proposed New Railway.—The report of the British Columbia Crown Lands Surveys for the year ending December 31, 1895, contains, among other things, an account of a projected railway (partly a revival of an old Canadian Pacific Railway project) between the Rocky Mountains and the coast. The proposed railway would start at Waddington harbour, at the head of Bute

inlet (which opens to the east of the widest part of Vancouver island); would then ascend the Homathco river and its east branch to a little above Tatlayoco lake; then, crossing various other valleys, would proceed on the whole eastwards to the Fraser; then, for the last 117 miles, ascend the Fraser valley southwards to the Yellow Head pass, where it would terminate at the height of 3646 feet, 477½ miles from its starting-point. In the first 50 miles it would rise above 2000 feet, and at several other places its altitude would exceed 3500 feet. The lower Homathco valley already has some sixty settlers, and it is believed that the railway would open up a country well suited in its lower levels (below 2500 feet) for cereals, fruits, and roots, and in its higher levels for cattle and sheep. Many parts of the route are well timbered (with Douglas fir, spruce, balsam, etc.). The report contains a plan showing the route, along with a section. It is proposed, also, to continue this line by another, 51 miles in length, along the north side of Bute inlet to the Frederick Arm, a small inlet to the north; at that point to establish a ferry across a channel of 15 miles to Otter cove, on Vancouver's island; and to make another line thence along the east coast of the island to Comox, 70 miles south, through good agricultural and timber land, covering probably not less than 200,000 acres.

The Red Lake Region, South-Western Keewatin.—The geological surveys of countries like Canada have much topographical work to do, and the cartographer, as well as the geologist and geographer, find much information in their reports. In 1893, the south-western triangle of Keewatin round Red lake was explored by Mr. Dowling, and his report has just been published ('Geological Survey of Canada, Annual Report,' vol. vii. Part F). The land mapped lies between the Berens river and Lac Seul, and that drained to the south forms almost an amphitheatre, highest in the east. The land is composed of laurentian gneiss and granite with huronian strata round Red, Shallow, and Woman lakes. Traces of glaciation are met with, especially among the latter rocks, and glacial deposits are found in the form of boulder-clay, or else as a "stratified or reassorted deposit in the form of fine clay, silt, and stratified sands." A ridge of morainic deposits, rising 270 feet above Trout lake, forms its southern boundary, and impresses the author as an accumulation along the front of an ice-sheet ending in deep water. The economic possibilities of the district are poor, the timber being of small growth. The red pine reaches as far as Red lake, which is its northern limit, and low cedars are found in isolated patches as far as the Height of Land. The Indians grow some potatoes here and there. In the missionary gardens near Lac Seul all the ordinary vegetables are cultivated.

POLAR REGIONS.

Tourist Trip to Spitzbergen.—Mr. P. L. Sclater, F.R.S., sends the following note: On August 2, having left Mr. Lockyer and other astronomers at Vadsoe to make ready for the coming eclipse, the s.s. *Garonne* turned its course northwards for a short visit to Spitzbergen. Passing Bear island early on the 4th, we found ourselves, about 8 o'clock on the following morning, at anchor in Advent bay, in Ice fjord, on the west coast of Spitzbergen. Here some enterprising Norwegians have lately erected a wooden hotel with twenty-five beds, and have established a weekly steamer from Hammerfest to keep it supplied with visitors during the summer months. Sir Martin Conway and his companions, who have established their head-quarters close by, had left the day before to visit the upper parts of the Ice fjord. On landing and walking a few yards from the gravelly beach, we found ourselves treading on a perfect carpet of wild flowers, amongst which large patches of *Silene acaulis* and various saxifrages were the most conspicuous. We passed a pleasant day on shore, sketching, photographing, and collecting plants and fossils. Some of the party visited the Miocene coal-seam on the mountains to the left, whilst others

went a long but fruitless chase after reindeer up the valley. Next day (August 5), starting at 2 a.m., we steamed back to Bel sound, and turned into Recherche bay, where we anchored about 10 o'clock under Observatory mountain. Recherche bay was accurately surveyed by the Training Squadron last year, and the results have lately been published in one of the Admiralty Charts, so that we had no difficulty about our course. Here we found ourselves surrounded by four splendid glaciers, two of which terminated in high faces breaking off into the sea. Passing Fox point on the right hand as we entered, the first of these was Scot glacier, descending into Calypso bay. In the next valley was seen the enormous Fox glacier, bordered on each side by a moraine 100 feet high, and presenting a perpendicular face to the sea of at least the same height and nearly 2 miles in width. On the opposite side of Observatory mountain lay East glacier, of about similar dimensions, and with a slightly longer perpendicular sea-front. On the left-hand side of Recherche bay as we entered, separated from East glacier by the Martin range and Pincher peak (2100 feet in height), lay the Village glacier, bordered on its sea-front by a mile of shingle and terminal moraine. These four glaciers and the adjacent snow-topped mountains surrounding this retired arm of the sea, presented a scene of unique aspect to the passengers in the *Garonne*, though it may probably be rivalled in other spots of this wonderful land. Landing near the foot of Fox glacier, a large party of us climbed the moraine and walked several miles on the surface of the ice, which is very level, and nearly free from crevasses or dangers of any description. From Recherche bay we returned direct to Vadsoe.

Sir W. M. Conway's Expedition.—Sir W. M. Conway and the other members of his party have returned from Spitzbergen, having, during the course of their excursions, effected the first crossing of the main island from sea to sea.

Mr. Andrée's Balloon Expedition.—Mr. Andrée has returned from Spitzbergen, having decided to postpone his expedition across the North Polar region in a balloon till next year.

MATHEMATICAL AND PHYSICAL GEOGRAPHY.

The Second Cruise of the "Princess Alice."—The *Comptes Rendus* contains a short note by H.S.H. the Prince of Monaco, on the second expedition of the *Princess Alice* to the region of the Azores, being his fourth and most successful exploration of those waters. The expedition left Monaco on May 23, 1895, and returned to Havre on August 16, about two months having been spent in actual work, which included thirty-five soundings in depths up to 2870 fathoms; twenty observations of bottom temperature; the collection of fourteen samples of bottom water for analysis; fourteen dredgings in depths between 300 and 2450 fathoms; and fourteen tow-nettings, besides other observations. A new instrument, called the Buchet apparatus, for collecting specimens of pelagic animals with the vessel under way, was found to work satisfactorily up to a speed of 7 knots; but there were few opportunities of using it, as almost every night during the voyage the sea was covered with dense layers of Medusæ, which threatened to destroy the apparatus by their weight. The success of the steel wire sounding-rope 2·3 mm. in diameter is worth noting in comparison with the results obtained formerly with the single wire. The zoological results of the expedition, so far as the material has already been examined, are of great interest. A fish of the genus *Chimæra*, caught between two of the islands at a depth of about 600 or 700 fathoms, may be mentioned; and some remarkable finds in the stomach of a cachalot harpooned by whalers, and towed by the *Princess Alice* into a creek in the island of Terceira. The Prince of Monaco is now developing a scheme for research by several vessels working in concert.

The Bay of Biscay.—The labours of M. A. Hautreux, of Bordeaux, on the oceanographical conditions of the Bay of Biscay, have already been noted in the *Journal* (see especially vol. iii. p. 309, and vol. iv. p. 463), and we have now to call attention to further papers by him published in the numbers of the *Bulletin* of the Bordeaux Commercial Geographical Society for 1895. They deal with the thermal conditions and the salinity of the water as determined by surface observations carried out (1) from the mouth of the Gironde to Cape Finisterre by the steamers of the Messageries maritimes from 1876 to 1880 inclusive; (2) westward from the Gironde by steamers bound for New York from 1882 to 1887 inclusive; (3) from the Gironde to Ushant by a local steamer in 1878; and (4) at Cape Breton, Cordouan, and Bordeaux for 1878, 1879, and 1880. In 1893 and 1894 a number of serial temperature observations at various depths were made off the coast of the Landes. While the irregular dates of the different series of observations make it impossible to attempt the construction of synoptic temperature charts, M. Hautreux has found it possible to put forward certain general conclusions, the evidence for which appears to us reasonably satisfactory, though incomplete. The shallow strip of sea, about 3 miles wide and less than 12 fathoms deep, between the mouths of the Gironde and the Adour, is backed by a line of sand-dunes which is broken about the centre by the entrance to the tidal basin of Arcachon. M. Hautreux shows that the water on this shallow belt is strongly influenced by the land, responding rapidly to the rainfall in salinity, and being much heated in summer, and so tending to spread seaward as a hot upper layer covering the colder ocean water of the outer part of the bay. The seaward spreading of this heated layer is, in his opinion, the cause for the remarkable slackening of the shoreward wind current near land which his experiments with floats discovered. The warm surface water of the Bay of Biscay in summer seems to form a homothermic layer, the depth of which increases until the month of August, and then rapidly thins away; the ocean water underneath undergoes but little change of temperature with the season, while in winter the surface water near shore is greatly cooled by tidal contact with the chilled land. A number of observations in the basin of Arcachon are also discussed. The seasonal variations of temperature and salinity there shows the influence of the land in a still higher degree, as might be expected, and the seasonal temperature curves show the greater amplitude and earlier phase characteristic of rivers as compared with estuaries, or any body of shallow water compared with a similar body of deep water. In the *Revue Maritime et Coloniale* for March last (vol. 128, p. 448), Lieut. de Kergrohen gives an account of the trip of the *Caudan* in the Bay of Biscay in June, 1895, for the purpose of making oceanographical and biological observations in deep water. The vessel had been fitted up with wire sounding and dredging gear, actuated by an electric motor driven by the dynamo machine which served to light the ship. The repeated breakage of the wire and wire-cable brought the trip to an abrupt close, but some soundings were made, and a large collection of marine fauna secured from considerable depths. Professors Thoulet, Koehler, and Roule, and M. le Dantec formed the scientific staff on board. The appliances used are figured in the paper, one of them being the simplest arrangement for detaching a weight and bringing up a sample of the bottom that has yet been successfully used.

The Temperature of the Soil.—Herr W. Böller contributes to the *Geographische Abhandlungen aus den Reichslanden Elsass-Lothringen* an exhaustive discussion of ten years' observations of soil-temperature at the meteorological forest stations at Hagenau, Neumath, and Melkerei, in Alsace-Lorraine. Each of these stations has a double set of instruments in the forest and in the open, the distance between the two in each case being small, and the results are accordingly very

fairly comparable. Herr Böller gives an excellent graphic representation of the normal changes of temperature between the surface and a depth of 4 feet, and adds an elaborate inquiry into the causes of various disturbances in the ordinary course of events. The most striking result is one which will be of considerable interest to botanists, viz. that most of the temperature variations in the soil are directly dependent on the conditions with regard to moisture. Until the mean amount of cloud at the station, the average humidity of the air and soil, and the level of the ground waters are fully taken into account, any mathematical consideration of the conductivity, etc., of the soil is premature. Herr Böller certainly brings this fact into greater prominence than has been done before.

Seismological Observatories.—In the seventh monthly issue of *Petermanns Mitteilungen*, 1896, a number of seismologists and others interested in the subject make an appeal on behalf of the establishment of an international net of earthquake stations for the systematic observation of the movements propagated from the great earthquake centres over the surface of and through the Earth. It is suggested that about ten stations should be equipped for the purpose, starting from Japan as a centre, and the ten following stations are named as suitable, their approximate spherical distance from Tokyo in degrees and kilometres (converted below into miles) being added:—

	Degrees.	Miles.		Degrees.	Miles.
1. Shanghai	16	1120	6. Tacubaya (Mexico) ...	102	7080
2. Hongkong	26	1800	7. Port Natal	121	8380
3. Calcutta	47	3230	8. Cape Town	136	9380
4. Sydney	69	4800	9. Santiago de Chile ...	154	10700
5. Rome	89	6150	10. Rio de Janeiro ...	167	11600

All these stations have the means of accurately determining the time, which is the first essential, and the chief further requirement is a horizontal pendulum with a registering apparatus. It is desirable that all the stations should have instruments of the same kind and the same degree of sensitiveness. The English men of science who sign the appeal are Dr. R. Copeland, Astronomer-Royal for Scotland; Mr. G. H. Darwin, Plumian Professor of Astronomy, Cambridge; Mr. C. Davison, Secretary British Association Earth-Tremors Committee, King Edward's High School, Birmingham; and Prof. John Milne, Shide Hill House, Newport, I.W.

GENERAL.

Local Geography in Prussia.—The Geographical Society of Greifswald has decided, according to *Aus allen Weltteilen* (May, 1896, p. 321), to form a special department for local geography (Heimatskunde). This department is primarily intended to give an opportunity for members by excursions and walks to obtain a close personal acquaintance with the country surrounding their homes, and also to encourage researches in local geography, which shall be published in the Society's annual report, and to collect books and pamphlets on the locality for the special local department of the Society's library. The following special points are suggested for preliminary consideration: 1. *The local maps.* Notes of errors in the existing maps, correction of wrong forms of names, suggestions for improvement; collection of old local maps. 2. *Land forms and geological structure.* Notes on erratic blocks, and ridges of pebbles, soils; particulars as to borings for wells, etc.; modifications of the coasts and of sand-dunes, etc. 3. *Hydrography.* Notes on changes in the volume of springs, streams, and rivers; cessation or formation of wells; changes of level in lakes and ponds; changes in the courses of streams. Notes on abnormal waves on the sea-coast, and on the colour and organisms of the sea-water.

4. *Climate and Meteorology.* Notes on all exceptional atmospheric phenomena. 5. *Flora and Fauna.* Notes on the extinction or introduction of new species; search for extinct forms in mosses, mud-deposits, and calcareous tufa. 6. *Prehistoric population.* Notes on the discovery of remains of early peoples; prehistoric monuments. 7. *Present population.* Notes on special manners and customs, magic and popular medicine, fairy tales and legends, names and nicknames, style of house-building, costume, dialect, etc. It is interesting to note that this scheme was presented to the Griefswald society almost simultaneously with the formulation of Dr. Mill's scheme for a detailed geographical description of the British Islands at the Royal Geographical Society.

Proposed Great Globe for London.—M. Reclus's scheme for the construction of a gigantic model of the globe has already given rise to a similar scheme in this country, though the proposed scale is smaller (1 : 500,000). The projector, Mr. T. Ruddiman Johnston, has forwarded us details of the scheme, with a sketch showing the appearance of the globe and its surroundings if finished according to the plan laid down. The diameter on the scale mentioned, which corresponds to about 8 miles to the inch, would be about 84 feet, or double that of the French globe of 1889, giving four times the surface area, and enabling all the important geographical features, and all towns with a population of 5000 and upwards, to be inserted. London would occupy an area rather larger than a penny. Access would be supplied by a spiral gallery running from base to summit, and the globe itself would revolve on its axis. Six specimen sections have already been prepared.

The Vasco da Gama Celebration in Portugal.—The programme for the celebration in 1897 of the fourth centenary of Vasco da Gama's departure for the discovery of the sea-route to India (*Journal*, vol. vii. p. 103), has already been prepared in its broad outlines. Its items are very varied, and include, among other solemnities, the holding of public exhibitions, naval demonstrations, and international competitions; the meeting of scientific congresses; the award of premiums for memoirs, etc., relating to Portuguese voyages and explorations, arts, industries, etc.; the preparation of a great planisphere, showing Portuguese journeys and discoveries by land and sea; and the preparation of a monumental edition of the 'Lusiads.' The 8th, 9th, and 10th of July are to be set apart as public holidays in every part of the Portuguese dominions, public thanksgiving services will be held in the churches, and naval and military reviews and civic processions will be held. Altogether the celebration promises to be well worthy of the greatness of the occasion.

The Seventh International Geological Congress.—By invitation of the Russian emperor, the next meeting of the International Geological Congress is to be held at St. Petersburg in 1897, under the presidency of M. A. Karpinsky. The following is the general programme of the meeting, which will take place towards the end of August, lasting about eight days. The sittings, which will not, as at Zürich, be held in sections, will be devoted particularly to the discussion of questions of principle most needing solution in the present state of the science. Special meetings will be held to enable the geologists present, Russian or foreign, to make communications respecting new discoveries, new instruments, etc., and facilities will be given for the exhibition of geological maps and other appliances. Among the excursions announced, some will be so arranged as to give an opportunity for visiting localities specially interesting from a geological point of view. These include visits to the Ural, the banks of the Volga, and to the Cambrian, Silurian, and glacial formations of Esthonia. Other more general excursions will be directed to Finland and the southern parts of the Russian empire, including Tiflis, Baku, Batum, etc. This last will probably last about a month.

Anthropological Queries.*—This series of questions has been drawn out by the committee "to whom the initiative in the comparative study of primitive law has been delegated." The questions are grouped under the following heads: I. General considerations. II. Family relations, which are again subdivided into, (*a*) general, (*b*) relationships, (*c*) responsibility of relatives for each other, (*d*) narrower family relations, (*e*) marriage relations, (*f*) relations out of marriage, (*g*) domestic life. III. Succession. IV. Political organization. V. Judicial system. VI. Revenge, fine, and imprisonment. VIII. Rights in movables. IX. Exchange relations. A number of searching questions are given under all these heads in order to elicit in as definite a manner as possible every important detail connected with the legal system of any African tribe. The detailed and thorough character of the questions is their most marked characteristic. They are given both in English and German. The English is a translation of which the character can be judged by the following examples: "Does the widow go back to her own family, or is she entailed upon the family of her husband? Are senile and sick persons killed? Are they also eaten? What reasons are given? What is the rule regarding suretiship (*sic*)? What power have the priests? Are they chosen from certain classes (hysterics, epileptics)? Do the men subsist chiefly by the chase, the women upon fruits and small beasts?" The questions are apparently intended to be given to missionaries, traders, and residents in Africa, in order that they may be answered on the blank pages which are interleaved. Yet it is obvious that only very few would have sufficiently thorough knowledge of the language of any one tribe to give correct and satisfactory answers. It is doubtful whether an Englishman, not knowing German, would understand what some of the questions mean. Still, any traveller with the aid of a Suahili interpreter would probably fill up all the questions if asked to do so. The committee appear to have foreseen this from an introductory note, which says, "The replies ought to be such as to permit a critical examination, not only of their value and of the extent of their validity, but also of the social bases of the phenomena concerned."

CORRESPONDENCE.

Ixtaccihuatl and Popocatepetl.

Hotel Handegg, Grimselstrasse, August 8, 1896.

At p. 140 of the August *Geographical Journal*, I see it stated that the writer is not aware of an authentic account of an ascent of Ixtaccihuatl. A full account (with illustrations) is, however, to be found in the *Alpine Journal*, vol. xv. (or xvi.), by H. R. Whitehouse. In the same periodical (to which there is an Index for the first fifteen or sixteen vols.) there are also several accounts of Popocatepetl, which are fuller and more precise than Mr. Howarth's.

W. A. B. Coolidge.

Lindertis, Kirriemuir, Scotland, August 19, 1896.

If Mr. O. H. Howarth had referred to the *Alpine Journal*, he would have seen, in the number for November, 1890, an authentic account of an ascent of Ixtaccihuatl by Mr. H. Remise Whitehouse on November 9, 1889, who found on the

* Fragebogen der internationalen Vereinigung für vergleichende Rechtswissenschaft u. Volkswirthschaft lehre zu Berlin über des Rechtsgewohnheiten der afrikanischen Naturvolker.

summit undoubted evidence that the mountain had been climbed five days previously by Mr. James de Salis. In the same paper Mr. Whitehouse says that a third ascent was made in April, 1890, by Professor Angelo Helprin and Mr. Mark C. Baker, of the Philadelphia Scientific Commission.

In two points Mr. Whitehouse is at direct variance with Mr. Howarth, for the former says, "The crater, although entirely filled with ice and snow, is clearly distinguishable, forming a cup with gently sloping sides between the three almost equally high summits, from one to the other of which one could drive a four-in-hand," while Mr. Howarth "is of opinion that Ixtaccihuatl has no crater, and does not represent any eruptive vent."

Mr. Howarth also says that "the so-called region of 'eternal snows' on the great summits is somewhat mythical. There is, in fact, no 'snow-line' even on Popocatepetl; . . . there are occasions when even at 17,000 feet most of the snow disappears." Mr. Whitehouse, in his ascent, encountered a "labyrinth of huge crevasses" and "snow-bridges spanning the great schrunds." On the summit "on all sides gigantic ice-cliffs (the largest I ever remember to have seen) hang over the glaciers below." It is needless to point out that such conditions as these could not be formed by one or two or three cold seasons, but are unquestionable evidence of eternal snows.

H. T. Munro.

GEOGRAPHICAL LITERATURE OF THE MONTH.

Additions to the Library.

By HUGH ROBERT MILL, D.Sc., *Librarian*, R.G.S.

The following abbreviations of nouns and the adjectives derived from them are employed to indicate the source of articles from other publications. Geographical names are in each case written in full:—

A. = Academy, Academie, Akademie.
Ann. = Annals, Annales, Annalen.
B. = Bulletin, Bollettino, Boletim.
Com. = Commerce, Commercial.
C. Rd. = Comptes Rendus.
Erdk. = Erdkunde.
G. = Geography, Geographie, Geografia.
Ges. = Gesellschaft.
I. = Institute, Institution.
J. = Journal.
M. = Mitteilungen.
Mag. = Magazine.
P. = Proceedings.
R. = Royal.
Rev. = Review, Revue, Revista.
S. = Society, Société, Selskab.
Sitzb. = Sitzungsbericht.
T. = Transactions.
V. = Verein.
Verh. = Verhandlungen.
W. = Wissenschaft, and compounds.
Z. = Zeitschrift.

On account of the ambiguity of the words *octavo*, *quarto*, etc., the size of books in the list below is denoted by the length and breadth of the cover in inches to the nearest half-inch. The size of the *Journal* is 10 × 6½.

EUROPE.

Alps. **Wherry.**

Alpine Notes and the Climbing Foot. By George Wherry. Cambridge: Macmillan & Bowes, 1896. Size 8 × 5½, pp. xvi. and 174. *Illustrations. Price 5s. Presented by Miss Cust.*

A series of newspaper articles, arranged in the inverse order of date, descriptive of Alpine tours; followed by a treatise on the position of the human foot in climbing, and a few remarks on the avoidance of accidents.

Austria—Dachstein. *M.G. Ges. Wien* **39** (1896): 140–156. **Böhm.**

Die Vollendung des Dachsteinwerkes von Friedrich Simony. Von Dr. August von Böhm. *With Plates.*

France. **Lallemand.**

Le Nivellement Général de la France. Par M. Charles Lallemand. Extrait des

Comptes-rendus du Sixième Congrès Géographique International tenu à Londres en Juillet, 1895. (Congress Report, 299–320.) Size 10 × 6½, pp. 22. *Illustrations.*

France—Corsica. *B.S.G. Marseille* **20** (1896): 23–44. **Nœtinger.**

Excursions en Corse. Le Niolo. Par M. F. Nœtinger.

The Niolo is a district in the centre of Corsica, where the inhabitants retain most fully their insular characteristics.

France—Lot. *Rev. G.* **38** (1896): 401–418. **Martel.**

Quatrième exploration de la rivière souterraine de Padirac (Lot), 28 mars—1er avril 1896. Par E. A. Martel. *With Map and Section.*

France—Population. ———

Rapport au Ministre du Commerce, de l'Industrie, des Postes et des Télégraphes sur le Mouvement de la Population de la France en 1894. Extrait du *Journal Officiel* du 53 Janvier 1896. Paris. Size 12½ × 9½, pp. 6. *Presented by M. Emile Levasseur.*

France—Population. *B.S. normande G.* **17** (1895): 137–164, 201–218. **Turquan.**

La population Française. Par M. Victor Turquan. *With Maps.*

France—Seine. **Lemoine and Babinet.**

Ponts et Chaussées. Service Hydrométrique du Bassin de la Seine. Observations sur les Cours d'Eau et la Pluie centralisées pendant l'Année 1894. . . . Par M. G. Lemoine et M. Babinet. Versailles: Aubert. Size 17 × 11. *Diagrams.*

France—Seine. **Babinet.**

Ponts et Chaussées. Service Hydrométrique du Bassin de la Seine. Résumé des Observations Centralisées par le Service Hydrométrique du Bassin de la Seine pendant l'Année 1894. Par M. Babinet. Versailles: Aubert, 1895. Size 10½ × 7, pp. 56.

France—Ushant. ———

Autour d'Ouessant (à propos du naufrage du *Drummond-Castle*). From *L'Illustration*, 107e volume, No. 2783. 27 Juin, 1896. Paris. Size 16 × 12, pp. [5]. *Maps and Illustrations.*

Germany. *Natur.-W. Wochenschrift* **11** (1896): 197–202. **Graebner.**

Klima und Heide in Norddeutschland. Von Dr. P. Graebner.

Germany—Kissingen. **Woerl.**

Woerl's Handbooks for Travellers. Guide to the Baths of Kissingen and the Environs. Publisher, Leo Woerl. Würzburg and Leipzig: Woerl's Reisebücher-Verlag. Size 6½ × 4½, pp. 50. *Plan and Illustrations.* Also a French edition at the same price. *Price 50 Pfennig. Presented by the Publisher.*

Germany—Oldenburg. **Sello.**

Deutsche G. Blätter **18** (1895): 350–372; **19** (1896): 41–58.

Die oldenburgische Kartographie bis zum Ende des 18 Jahrhunderts. Von Dr. G. Sello.

Germany—Saxony. *Deutsche G. Blätter* **19** (1896): 11–61. **Gebauer.**

Die Waldungen des Königreichs Sachsen. II. Von Heinrich Gebauer.

Germany—Schleswig. *Globus* **69** (1896): 290–293. **Hansen.**

Zur Geschichte der Zersplitterung Nordstrands. Von Dr. R. Hansen.

An historical account of the changes in the island of Nordstrand, in the North Frisian group, with references to the literature of the subject.

Hungary—Tatra. *Jahrb. Ungarischen Karpathen-Vereines* **23** (1896): 1–46. **Steiner.**

Die Gesteine der Hohen Tátra, mit Rücksicht auf deren industrielle Verwerthung. Von Dr. Anton Steiner.

On the economic uses of the granite, gneiss, mica-schist, and felspar of the High Tatra.

Hungary—Tatra. *Jahrb. Ungarischen Karpathen-Vereines* **23** (1896): 47–65. **Dénes.**

Gebirgstouren in den Béler Kalkalpen. Von Franz Dénes.

Hungary—Tatra. **Szontágh.**

Jahrb. Ungarischen Karpathen-Vereines **23** (1896): 112–124.

Lebensweise und Verbreitung der Gemse in der Hohen Tátra. Von Dr. N. Szontágh.

A picturesquely written account of the distribution and habits of the chamois in the High Tatra.

Italy. *Riv. G. Italiana* **3** (1896): 13–18. **Marinelli.**

Escursione ai laghi Laziali. Nota del prof. Olinto Marinelli.

Italy—Lake Como. *Riv. G. Italiana* **3** (1896): 105–111. **Marinelli.**

Sopra alcune ricerche relative alle condizioni di temperatura del lago di Como. Nota di Olinto Marinelli.

Italy—Papal States. **Guiraud.**

Bibliothèque des Écoles Françaises d'Athènes et de Rome publiée sous les auspices du Ministère de l'Instruction Publique. Fascicule Soixante-Treizième. L'État Pontifical après le Grand Schisme, Étude de Géographie Politique. Par Jean Guiraud. Paris: A. Fontemoing, 1896. Size 9½ × 6½, pp. 252. *Maps.*

A study of historico-political geography.

Norway. **Goodman.**

New Ground in Norway, Ringerike—Telemarken—Sætersdalen. By E. J. Goodman. With Fifty-six illustrations, from Original Photographs by Paul Lange. London: G. Newnes, 1896. Size 9 × 6, pp. xvi. and 224. *Map and Illustrations. Price* 10*s.* 6*d. Presented by the Publisher.*

The "new ground" described here is Southern Norway as seen by Mr. Goodman in a recent tour. As the country is very easily accessible and well supplied with facilities for the ordinary tourist, it should become popular amongst British as it has long been amongst Norwegian holiday-makers. The illustrations are good.

Norway—Hardanger. **Mockler-Ferryman.**

In the Northman's Land, Travel, Sport, and Folk-lore in the Hardanger Fjord and Fjeld. By Major A. F. Mockler-Ferryman. With Map, Illustrations, and Appendix. London: Low & Co., 1896. Size 8 × 5½, pp. xvi. and 316. *Price 7s. 6d. Presented by the Publishers.*

This excellent book describes the author's excursions in the region of the Hardanger fjord and fjeld, with many interesting digressions on natural history and folk-lore. The map is clear, if not very full, and the illustrations are good and interesting.

Norway—Norwegian Club. ——

The Year-Book of the Norwegian Club, 1896. Edited by Charles Peters. London: Printed by W. Clowes & Sons. Size 8½ × 5½, pp. 70. *Illustrations. Price* 1*s. Presented by the Editor.*

The longest article in this "Year-book" is on Mountaineering in Norway, by Wm. Cecil Slingsby.

Russia—Caucasus. **Freshfield and Sella.**

The Exploration of the Caucasus. By Douglas W. Freshfield, lately President of the Alpine Club, formerly Honorary Secretary of the Royal Geographical Society. With Illustrations by Vittorio Sella. 2 vols. London and New York: E. Arnold, 1896. Size 11½ × 8, pp. (vol. i.) xxiv. and 278, (vol. ii.) x. and 296. *Map. Price* 63*s. Presented by the Authors.*

This splendid work, written by Mr. Freshfield and illustrated by Signor Sella, is the subject of a special notice in the August number.

Russian—Caucasus—Houses. *Globus* **69** (1896): 267–270. **Hahn.**

Kaukasische Dorfanlagen und Haustypen. Von C. Hahn. Tiflis. *With Illustrations.*

Russia—Caucasus—Tiflis Museum. ——

Bericht über das Kaukasische Museum und die öffentliche Bibliothek in Tiflis für das Jahr 1894 und 1895. Tiflis, 1895. Size 9 × 6, pp. 20 and 26. *Presented by the Caucasian Museum.*

Russia—Mountains. *Verh. Ges. Erdk. Berlin* **23** (1896): 229–244. **Futterer.**

Herr Prof. Dr. Karl Futterer: Vergleichende Charakteristik des Ural und des Kaukasus.

Russia—Viatka. **Krotow.**

Allgemeine geologische Karte von Europäischen Russland. Blatt 89. Geographischer Theil. Oro-Hydrographische Skizze des westlichen Theiles des Regierungsbezirks Wjatka, im Bereiche von Blatt 89. Von P. Krotow.—Mémoires du Comité Géologique. Vol. xiii., No. 2. St. Pétersbourg: Eggers & Cie., 1894. Size 13½ × 10, pp. iv. and 242. *Map.* [In Russian.]

Scandinavia. **Boutroue.**

En Scandinavie. Notes de Voyage. Le pays, ses monuments et ses habitants. Conférence faite à l'Assemblée Générale de la Société de Géographie de Paris le 19 Avril 1895. Par Alexandre Boutroue. Extrait de la *Revue de Géographie* (Juillet—Août—Septembre 1895). Paris: E. Leroux, 1896. Size 10 × 6½, pp. 36. *Map. Presented by the Author.*

Switzerland. **Lubbock.**

The Scenery of Switzerland and the causes to which it is due. By the Right Hon. Sir John Lubbock, Bart., M.P. London: Macmillan & Co., 1896. Size 8 × 5½, pp. xxxvi. and 480. *Map and Illustrations. Price* 6*s. Presented by the Publishers.*

This summary of the physical features of Switzerland will be found of great interest and value to many tourists who, desirous of knowing something of the nature and origin of the Alps, are yet disinclined or unable to consult the original sources of information. Sir John Lubbock has been at great pains to make the book full and clear; he has introduced a profusion of diagrams rare in such volumes, and appends a useful bibliography.

Turkey—Monastic. *Aus allen Welttheilen* **27** (1896): 259–266, 293–300. **Fitzner.**

Der Golf von Monastir. Von Rudolf Fitzner.

United Kingdom—England. ——

Report of the Director of the Observatory to the Marine Committee, and Meteorological Results deduced from the Observations taken at the Liverpool Observatory, Bidston, Birkenhead, in the year 1895. The Liverpool Printing and Stationery Co., Limited, 1896. Size 9½ × 6, pp. 48.

United Kingdom—English Lakes. *J. Geological S.* **52** (1896): 12–16. **Marr.**

Additional Notes on the Tarns of Lakeland. By J. E. Marr. *With Illustrations.*

United Kingdom—English Lakes. **Marr.**

The Waterways of English Lakeland. By J. E. Marr. From the *Geographical Journal* for June, 1896. Size 10 × 6½, pp. 24. *Map and Illustrations.*

United Kingdom—Geological Survey. **[Geikie.]**

Appendix to the 43rd Report of the Department of Science and Art. Annual Report of the Geological Survey and Museum of Practical Geology for the year ending December 31, 1895. Size 10 × 6½, pp. 48.

United Kingdom—Ireland. *P.R. Irish A.* (3) **3** (1896): 727–732. **Bigger.**

Prehistoric Settlements at Portnafeadog, in the Parish of Moyrus, Connemara. By Francis Joseph Bigger. *With Plates.*

United Kingdom—Scotland. *Blackwood's Mag.* (1896): 16–28. **Maxwell.**

How Summer came to Caithness. By Sir Herbert Maxwell, Bart., M.P.

ASIA.

Afghanistan. *P.R.I.* **14** (1896): 568–579. **Curzon.**

A Recent Journey in Afghanistan. By the Hon. G. N. Curzon, M.P.

Asia Minor. *Globus* **69** (1896): 350–355. **Goebeler.**

Die Forschungsreise des Abbé Le Camus nach Kleinasien. Von Dr. Erich Goebeler. II. *With Illustrations.*

Asia Minor—Phrygia. **Ouvré.**

Un Mois en Phrygie. Par H. Ouvré. Paris: E. Plon & Cie., 1896. Size 7½ × 5, pp. 272. *Illustrations.*

Description of a journey in the summer of 1893.

Central Asia—Pamirs. **Hedin.**

A travers le Monde (*Tour du Monde*), *n.s.* **2** (1896): 177–180.

Quelques esquisses de la Commission anglo-russe de délimitation des Pamirs (Août & Septembre, 1895). Note inédite de M. Sven-Hedin. *With Illustrations.*

Central Asia—Pamirs. *B.S.G. Paris* (7) **16** (1895): 516–560. **Poncins.**

Du Turkestan au Kashmir à travers les Pamirs. Par Edmond de Poncins. *With Map.*

Ceylon. ——

Ceylon in 1896. [Reprinted from the *Ceylon Observer.*] 1896. Size 5½ × 4½, pp. 30. *Presented by J. Ferguson, Esq.*

Ceylon. *Asiatic Quarterly Rev.* (3) **2** (1896): 103–108. **Berwick.**

British Rule in Ceylon. By Thomas Berwick, retired District Judge of Colombo.

China. *Asiatic Quarterly Rev.* (3) **2** (1896): 23–33. **Bell.**

The Country of the Dungan Rebellions of 1861, and 1895-6. By Colonel Mark Bell.

India. *B.S.G. Marseille* **20** (1896): 45–53. **Maigre.**

Notes de Voyage. Pondichéry et Cocanada. Par M. E. Maigre.

The author draws an unfavourable picture of the British administration in India by contrasting the appearance of the towns of Pondichéry and Cocanada.

India and Russia. **Holdich.**

A Geodetic Connection between the Surveys of Russia and India. By Colonel Holdich, C.B., etc. Reprinted from the Report of the Sixth International Geographical Congress, held in London, 1895 (Congress Report, pp. 287–298). Size 10 × 6½, pp. 12.

India—Bengal. *P. Linnean S.*, 1894–95 (1896): 14–29. **Clarke.**

[Linnean Society.] Presidential Address, [by Mr. C. B. Clarke.] On the Sunderaban of Bengal.

This is the subject of a special note.

India—Burma. **Woodthorpe.**

The Country of the Shans. By Colonel R. G. Woodthorpe, C.B., etc. From the *Geographical Journal* for June, 1896. Size 10 × 6½, pp. 26. *Map and Illustrations.*

India—Darjiling *J.S. Arts* **44** (1896): 623–650. **Christison.**

Tea Planting in Darjeeling. By Geo. W. Christison. *With Maps.*

India—Goa. *Oesterreichische Monats. Orient* **22** (1896): 56–58. **Baumann.**

Goa. Von Dr. Oscar Baumann.

India—Kashmir. **Stein.**

Notes on the Ancient Topography of the Pīr Pantsāl Route. By M. A. Stein, PH.D. [Reprinted from the *Journal of the Asiatic Society of Bengal*, vol. lxiv. part i. No. 4, 1895.] Calcutta, 1896. Size 10½ × 7, pp. 12. *Presented by the Author.*

India—Orissa. **Hill.**

Trigonometrical Branch, Survey of India. Spirit-Levelled Heights. No. 9, Orissa and the Northern Circars. Season 1894–95. Prepared . . . by Colonel J. Hill. Dehra Dun, 1896. Size 9½ × 6½, pp. viii. and 56. *Map. Presented by the Secretary of State for India.*

A map showing the position, and a table giving the description of the bench-marks for altitude fixed by the Great Trigonometrical Survey in Orissa.

Indian People. *M.G. Ges. Wien* **39** (1896): 113–139. **Rosset.**

Die hinterindischen Volksstämme. Von C. W. Rosset.

Malay Archipelago—Celebes—Makassar. *Globus* **69** (1896): 345–350. **Radde.**

Besuch von Mangkassar. Von Dr. Gustav Radde.

Siberia. *B.S.G. Marseille* **20** (1896): 5–22. **Levat.**

De Moscou à Vladivostok. Étude sur le Chemin de Fer Transsibérien et la Navigation du Fleuve Amour. Conférence de M. David Levat. *With Map and Illustrations.*

This journey was undertaken in company with M. T. Sabachnikoff, a Russian official.

Siberia. *Aus allen Welltteilen* **27** (1896): 269–276, 307–318. **Fritz.**

Ost-Sibirien. Aus dem Russischen von G. L. Fritz.

Siberia. **Sabachnikoff and Levat.**

La Sibérie et le Chemin de Fer Transsibérien. Par MM. Th. Sabachnikoff et E. D. Levat. Extrait de la *Vie Scientifique*. Paris, 1896. Size 11 × 7, pp. 12. *Map and Illustrations. Presented by the Authors.*

An illustrated description of a journey along the great Siberian railway in 1895.

Siberia. **Sabachnikoff and Levat.**

Le Transsibérien et la Navigation sur le fleuve Amour. Par MM. Théodore Sabachnikoff et Édouard David Levat. Paris: Bureaux de la *Revue Scientifique*, 1896. Size 9 × 6, pp. 52. *Map and Illustrations. Presented by the Authors.*

With plans and profiles on a small scale of the Trans-Siberian Railway.

Siberia. **Shokalsky.**

Les Recherches des Russes de la route maritime de Sibérie. Par Jules de Shokalsky. Extrait des Comptes-rendus du Sixième Congrès International de Géographie tenu à Londres en Juillet, 1895. (Congress Report, pp. 239–246.) Size 10 × 6½, pp. 8. *Maps.*

Syria—Palestine. **Chauvet and Isambert.**

Collection des Guides-Joanne. Itinéraire descriptif, historique et archéologique de l'Orient. Par le Dr. É. Isambert. Tome Troisième. Syrie, Palestine comprenant le Sinaï, l'Arabie Pétrée et la Cilicie. Par Ad. Chauvet et É. Isambert. Édition de 1882 avec des renseignements pratiques mis au courant en 1895. Paris: Hachette & Cie. Size 7½ × 4½, pp. lvi., 816, and 24. *Map and Plans. Also Maps and Plans in separate case.*

AFRICA.

Abyssinia. *J.R. United Service I.* **40** (1896): 719–733. **Fedoroff.**

Abyssinia: a Brief Sketch of its Geography and History. Translated from the Russian of V. Fedoroff by Lieut.-Colonel W. E. Gowan. *With Map.*

Africa. *National G. Mag.* **7** (1896): 157–175. **Hubbard.**

Africa since 1888, with special reference to South Africa and Abyssinia. By Hon. Gardiner G. Hubbard, LL.D. *With Map and Portrait.*

Africa. *Contemporary Rev.* (1896): 37–45. **Pease.**

Africa North of the Equator. By A. E. Pease. *With Map.*

Africa and India. *Asiatic Quarterly Rev.* (3) **2** (1896): 37–45. **Younghusband.**

India and Africa. By Captain Frank E. Younghusband.

A discussion of the possibility of utilizing Indian methods and men in the development of Africa.

African Anthropology. ——

Questions concerning the law customs of the African natives submitted by the International Association for Comparative Jurisprudence and Political Economy of Berlin. Size 13½ × 8½, pp. 8. *Presented by Professor Holland.*

British South Africa. *Scottish G. Mag.* **12** (1896): 281–289. **Fort.**

British South Africa. By G. Seymour Fort. *With Map.*

Cape Colony. **Wallace.**

Farming Industries of Cape Colony. By Robert Wallace. London: P. S. King & Son, 1895. Size 9 × 6, pp. xxxii. and 552. *Maps and Illustrations. Price* 10*s.* 6*d.* *Presented by the Publishers.*

This important book, which in large measure deals with the economic geography of South Africa, will be the subject of a special note.

Congo State. *Mouvement G.* **13** (1896): 254–256. ——

Notre Carte en Supplément.

This is a new map on the scale of 1 : 2,000,000 of the region included between the great northern bend of the Congo and the Welle-Mobangi, including the basins of the Nigiri, the Mongala, and the Rubi.

East Africa—Somaliland. *Globus* **69** (1896): 361–367. **Keller.**

Reisestudien in den Somalilándern. Von Prof. Dr. C. Keller. Zürich. *With Illustrations.*

Eastern Africa. **Chanler.**

Through Jungle and Desert: Travels in Eastern Africa. By William Astor Chanler. With Illustrations from Photographs taken by the Author and Maps. London: Macmillan & Co., 1896. Size 10 × 7, pp. xiv. and 536. *Price* 21*s.* *Presented by the Publishers.*

This will receive special notice.

Egypt—Lake Menzaleh. *J. Victoria I.* **28** (1896): 267–280. **Tulloch.**

The Passage of the Red Sea by the Israelites: Notes made during a Military Survey. By Major-General A. B. Tulloch, C.B., etc. *With Map.*

This paper describes the temporary disappearance of Lake Menzaleh during the prevalence of a strong wind, which blew the shallow water away, laying bare the bed of the lake.

Eritrea, etc. *Globus* **69** (1896): 233–235. ——

Der Wert von Italienisch-Afrika. *With Map.*

German East Africa. *M. Deutsch. Schutzgeb.* **9** (1896): 78–85. **Ziegenhorn.**

Das Rufiyi-Delta. Nach einem Bericht des Zollamts-Assistenten-2-Klasse Ziegenhorn.

German East Africa—Uhehe. **Schele and Elpons.**

M. Deutsch. Schutzgeb. **9** (1896): 67–77.

Uhehe. Von Oberst Freiherrn v. Schele. *With Map and Plan.*

Uhehe. Von Kompagnieführer v. Elpons.

German South-West Africa. **François.**

Nama und Damara, Deutsch-Süd-West-Afrika. Herausgegeben von H. von François. Magdeburg: E. Baensch, jun. Size 11 × 8, pp. 334 and xxviii. *Maps, Portraits, and Illustrations. Price* 10*s.* 6*d.*

This will be separately noticed.

German West Africa. *M. Deutsch. Schutzgeb.* **9** (1896): 53–63. **Gruner and Baumann.**

Die Resultate der meteorologischen Beobachtungen in Misahöhe von Dr. Gruner und E. Baumann 1892 bis 1895. *With Plate.*

A picture of the meteorological station is given, as well as an account of the instruments employed and a complete transcript of the observations.

German West Africa—Kamerun. **Hübler.**

Münchener Geographische Studien, herausgegeben von Siegmund Günther. Erstes Stück: Zur Klimatographie von Kamerun. Von Dr. Michael Hübler. München: T. Ackermann, 1896. Size 9½ × 6, pp. iv. and 88. *Price* 1*s.* 6*d.*

Madagascar. *Verh. Ges. Erdk. Berlin* **23** (1896): 170–184. **Voeltzkow.**

Herr Dr. A. Voeltzkow: West-Madagaskar auf Grund eigener Anschauung.

South-East Africa. **Muller.**

Land und Leute zwischen Zambesi und Limpopo. Von Dr. Hendrik P. N. Muller. Giessen: Emil Roth, [1894.] Size 9 × 6½, pp. 166. *Map and Illustrations. Price* 6 *marks. Presented by the Publisher.*

Although written two years ago, this little book is useful at the present time as giving a clear account of the physical geography and inhabitants of a part of Africa on which all eyes are now fixed.

South-East Africa. **Mager.**

XIII. u. XIV. Jahresb. (1894 *u.* 95) *Württemberg. Ver. Handelsg.* (1896): 78–97.

Die Auswanderung nach Südostafrika mit besonderer Berücksichtigung der von Karl Mauch bereisten Gebiete. Von E. Mager.

A supplement to the author's work entitled 'Karl Mauch; Lebensbild eines Afrikareisenden.'

South-East Africa. **Schlichter.**

XIII. u. VIV. Jahresb. (1894 *u.* 95) *Württemberg. Ver. Handelsg.* (1896): 98–133.

Neues über Karl Mauchs Forschungen in Südostafrika. Von Dr. H. G. Schlichter.

Tunis. **Toutain.**

Bibliothèque des coles Françaises d'Athènes et de Rome Épubliée sous les auspices du Ministère de l'Instruction Publique. Fascicule Soixante-Douzième. Les Cités Romaines de la Tunisie. Essai sur l'Histoire de la Colonisation Romaine dans l'Afrique du Nord. Par J. Toutain. Paris: A. Fontemoing, 1896. Size 9½ × 6½, pp. 412. *Maps. Price* 11*s.*

NORTH AMERICA.

America. *National G. Mag.* **7** (1896): 175–181. **Hill.**

Fundamental Geographic Relation of the Three Americas. By Robert T. Hill. *With Map.*

Canada. *T. Canadian I.* **4** (1895): 299–313. **Cruikshank.**

Early Traders and Trade Routes, 1760–1782. (Second Paper.) By Capt. Ernest Cruikshank.

Canada—British Columbia. **McConnell.**

Part C. Annual Report, vol. vii. Geological Survey of Canada. G. M. Dawson, C.M.G., etc., Director. Report on an Exploration of the Finlay and Omenica Rivers. By R. G. McConnell. Ottawa: 1896. Size 10 × 6½, pp. 40. *Map and Plates. Presented by the Geological Survey of Canada.*

Canada—British Columbia.

British Columbia. Crown Lands Surveys for the Year ending 31st December, 1895. Victoria, B. C., 1896. Size 11 × 7½, pp. [108.] *Map and Plate.*

Canada—Indians. *Aus allen Welttheilen* **27** (1896): 265–270. **Lemcke.**

Unter den Indianern in Canada. Von Heinrich Lemcke.

Canada—Lake Ontario. *T. Canadian I.* **4** (1895): 279–283. **Cruikshank.**

The Journal of Captain Walter Butler, on a Voyage along the North Shore of Lake Ontario, from the 8th to the 16th of March, 1779. By Captain Ernest Cruikshank.

Mexico—Sonora. *National G. Mag.* **7** (1896): 125–133. **McGee and Johnson.**

Seriland. By W. J. McGee and Willard D. Johnson. *With Map and Illustration.*

United States—Alaska. **Rodman.**

Treasury Department, United States Coast and Geodetic Survey. Bulletin No. 35. Alaska. General Information relating to the vicinity of Chatham and Peril Straits, from a recent survey by the U.S. Coast Survey Steamer *Patterson*, Lieut.-Commander E. K. Moore, U.S.N., commanding, and Cooks Inlet and the region to the westward. By W. H. Dall, U.S. Geological Survey. Arranged and compiled by Hugh Rodman. Washington: 1896. Size 9½ × 6, pp. [36.]

United States—Alaska. *National G. Mag.* **7** (1896): 140–146. **Scidmore.**

The Discovery of Glacier Bay, Alaska. By Eliza Ruhamah Scidmore. *With Map and Illustration.*

United States—California. *Sierra Club B.* **1** (1896): 293–313. **Brown.**

A Trip about the Headwaters of the South and Middle Forks of King's River. By Bolton Coit Brown. *With Illustrations.*

United States—California. *Sierra Club B.* **1** (1895): 168–186. **McClure.**

Explorations among the Cañons North of the Tuolumne River. By N. F. McClure. *With Sketch-Maps.*

United States—Connecticut. **Davis.**

Connecticut School Document, No. 6—1896. (Whole Number—119.) The State Map of Connecticut as an aid to the study of Geography in Grammar and High Schools. By William Morris Davis. 1896. Size 9 × 6, pp. 14.

This was noticed in the *Journal* for June, vol. vii. p. 665.

United States—Eleventh Census.

[Eleventh Census of the United States, 1890.] Report on the Statistics of Agriculture in the United States; Report on Agriculture by Irrigation in the Western part of the United States (1894–95, pp. 606, viii., and 284. 38 *Maps and Illustrations.*) Report on Transportation Business. Part I. Transportation by Land. Washington, 1895. Size 12 × 9½, pp. viii. and 868. *Maps. Presented by the United States Census Bureau.*

These volumes of statistics are accompanied by illustrative maps, which show the distribution of the various quantities dealt with in the tables. The agricultural maps will form the subject of a special note.

United States—Hydrography. *National G. Mag.* **7** (1896): 146–150. **Newell.**

Hydrography in the United States. By Frederick H. Newell.

United States—Kansas River. *National G. Mag.* **7** (1896): 181–184. **Davis.**

The Kansas River. By Arthur P. Davis.

United States—Missouri River. **Brower.**

The Missouri River and its Utmost Source. Curtailed narrative of geologic, primitive, and geographic distinctions descriptive of the Evolution and Discovery of the River and its Headwaters. By Hon. J. V. Brower. St. Paul, Minn., 1896. Size 9½ × 6½, pp. xxviii. and 150. *Maps and illustrations. Presented by the Author.*

This will be separately noticed.

United States—Smithsonian Report.

Annual Report of the Board of Regents of the Smithsonian Institution, showing the Operations, Expenditures, and Condition of the Institution for the year ending June 30, 1893. Report of the U.S. National Museum. Washington: Government Printing Office, 1895. Size 9½ × 6, pp. xxii. and 794. *Plates.*

United States—Virginia. **Chandler.**

Johns Hopkins University Studies in Historical and Political Science. Fourteenth Series, vi.–vii. Representation in Virginia. By Julian A. C. Chandler. Baltimore: The Johns Hopkins Press, 1896. Size 10 × 6¼, pp. 84.

United States—Washington. *National G. Mag.* 7 (1896): 133-140. **Gilman.**
The Olympic Country. By the late S. C. Gilman. *With Map.*

United States—West Virginia. **Millspaugh and Nuttall.**
Field Columbian Museum. Publication 9. Botanical Series, vol. i. No. 2. Flora of West Virginia. By Charles Frederick Millspaugh and Lawrence William Nuttall. Chicago, 1896. Size 10 × 6½, pp. [206.] *Map and Plates. Presented by the Director of the Museum.*

CENTRAL AND SOUTH AMERICA.

Argentine Republic—Buenos Ayres.
Annuaire Statistique de la Ville de Buénos-Ayres. V^me^ Année, 1895. Buénos Ayres, 1896. Size 11 × 7½, pp. cxx. and 476. *Plans and Diagrams. Presented by the City of Buenos Ayres.*
This volume contains a plan of Buenos Ayres on the large scale of 1 : 10,000.

Brazil. **Siemiradzki.**
Biblioteka Polskiego Towarzystwa Handlowo-geograficznego. Tom. I. Opis Stanu Parana w Brazylii . . . inzynier Manoel Francisco Ferreira Correia i baron Serro Azul z oryginalu angielskiego przelozyl prof. Dr. Józef Siemiradzki. Lwów, 1896. Size 8 × 5½, pp. 80. *Map.*

NEW MAPS.

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EUROPE.

England and Wales. **Ordnance Survey.**
Publications issued since July 7, 1896.
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Town Plans—10-feet scale:—
ENGLAND AND WALES:—**Newcastle, Gateshead and Environs** (revision), 66, 67, 77, 79, 85, 89, 90, 97, 99, 101, 142, 2*s.* 6*d.* each. **Tynemouth, North and South Shields** (revision), 17, 2*s.* 6*d.* This town is now complete in 80 sheets, 2*s.* 6*d.* each. Index, 6*d.* **Wallsend, Jarrow and Environs,** 25, 35, 2*s.* 6*d.* each. This town is now complete in 46 sheets, 2*s.* 6*d.* each. Index, 4*d.*

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London—Re-survey. The revised edition of London is now complete in 756 sheets, 2*s.* 6*d.* each. Index, 3*d.*
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Sweden. **Sveriges Geologiska Undersökning.**

Sveriges Geologiska Undersökning. Scale 1 : 50,000 or 0·78 stat. miles to an inch. Sheets :—"Vittsjö," "Sandhammaren," "Grisslehamn," "Skanör."

Geologisk Öfversigtskarta öfver Jemtlands Län pa grundvalen af Sveriges Geologiska Undersoknings Arbeten och andra källor upprättad af A. G. Högbom. Scale 1 : 500,000 or 7·8 stat. miles to inch. 1894. *Presented by l'Institut Royal Géologique de Suede.*

AFRICA.

Africa. **Bartholomew.**

Political Map of Africa according to most recent treaties. By J. G. Bartholomew, F.R.G.S. Scale 1 : 12,000,000 or 189·4 stat. miles to an inch. 1896. J. Bartholomew & Co., Edinburgh. *Presented by the Publishers. Price* 3*s., mounted on cloth.*

This is a new edition of Bartholomew's political map of Africa, on which all international boundaries have been carefully laid down according to the most recent treaties. Insets on an enlarged scale are given of important places, and it is, for all purposes of reference, a very useful map.

Africa, South-East. **Muller.**

Neue Karte des Landes zwischen Zambesi und Limpopo auf Grund des bekannten Kartenmaterials und nach eigener Kenntniss zusammengestellt von Dr. Hendrik P. N. Muller. Scale 1 : 4,000,000 or 63·1 stat. miles to an inch. Verlag von Emil Roth in Giessen. *Presented by Dr. Hendrik P. N. Muller.*

AMERICA.

Brazil. **Commissão Geographica e Geologica de Minas Geraes.**

Commissão Geographica e Geologica de Minas Geraes. Scale 1 : 100,000 or 1·6 stat. miles to an inch. *Flha.* No. 2, S_2O_1 S. João D'el Rei. *Flha.* No. 1, S_1E_1 Barbacena. 1895. *Presented by the Chief Engineer of the Survey.*

These two sheets form part of the survey of the Brazilian province of Minas Geraes, which is now being carried on by the Geographical and Geological Commission. The differences in altitude are shown by 50-metre contour-lines, the roads are marked in red, and the water is coloured blue. A full explanation is given of the symbols employed, and the style in which the map is being produced is a very great improvement on anything that has hitherto been issued in Brazil.

GENERAL.

German Colonies. **Langhans.**

Deutscher Kolonial-Atlas. 30 Karten mit über 300 Nebenkarten entworfen, bearbeitet und herausgegeben von Paul Langhans. Erscheint in 15 Lieferungen (jede mit 2 karten). Parts IX. and X. 1896. Gotha: Justus Perthes. *Price* 1 *mk.* 60 *pf. each part.*

Part IX. of this atlas contains map No. 11, sheet 1, of the German possessions in the Cameroons and Togoland. No. 18 is sheet 4 of the German possessions in South-West Africa. Part X. contains No. 9, a map showing the distribution of Germans in South America. No. 13 is sheet 3 of the map of the Cameroons and Togoland. On each of the sheets numerous insets are given, the routes of explorers are shown, together with notes and information as to telegraph and ocean steamers.

World, Ancient. **Miller.**

Mappaemundi. Die ältesten Weltkarten. Herausgegeben und erläutert von Dr. Konrad Miller. IV. Heft : Die Herefordkarte. Mit 2 Uebersichtskarten im Text und der Herefordkarte in Farbendruck als Beilage, 1896, Stuttgart. Jos. Roth'sche Verlagshandlung. *Price* 5 *marks.*

In the present issue of this series a reduced facsimile of the Hereford map is given. Following a general description of the map, and a comparison of it with the Ebstorf map, are the notes which appear on the map itself, and a list of the names, identifying as far as possible their positions. The letterpress concludes with the author's remarks on the sources from which the original map was compiled. The colouring of the original map has not been strictly adhered to, but in other respects it is a very fair reproduction.

CHARTS.

Admiralty Charts. **Hydrographic Department, Admiralty.**

Charts and Plans published by the Hydrographic Department, Admiralty, during May and June, 1896. *Presented by the Hydrographic Department, Admiralty.*

No.	Inches.	
2939 to 2950		Twelve Monthly Current Charts for the Indian ocean. 6*d.* each. The same charts bound together in an atlas. 7*s.*
2040	m = 2·75	England, south coast:—The Solent, including the Needles channel (republication). 2*s.* 6*d.*
2879	m = 6·9	England, west coast:—Milford haven. 3*s.* 6*d.*
1298	m = 1·44	Norway, west coast:—Approaches to Molde. 2*s.* 6*d.*
1291	m = 1·44	Norway, west coast:—Nerlandsö to Lepsö, including the approaches to Aalesund. 2*s.* 6*d.*
1297	m = 1·44	Norway, west coast:—Lepsö to Ona, including the outer approaches to Molde. 2*s.* 6*d.*
300	m = var.	Anchorages on the west and north coasts of Spitzbergen:—Recherche bay, Skans bay, Advent anchorage, Magdalena bay to Foul bay, Treurenburg bay. 2*s.* 6*d.*
1546	m = 0·8	Asia Minor:—Strait of Samos to Mandelyah gulf (reproduction). 2*s.* 6*d.*
2456	m = 0·9	America, east coast:—Nantucket sound and western approaches. 2*s.* 6*d.*
3563	m = 0·6	North America, east coast:—Delaware river, Sheet 1. 2*s.* 6*d.*
2346	m = var.	Plans on the coast of Chile:—Lautaro cove, Tames bay, Coloso cove, Colorado cove, Camarones cove, Caleta Chica, Michilla and Gualaguala coves. 1*s.* 6*d.*
617	m = 1·0	Africa, west coast:—Sherbro river. 3*s.*
1863	m = 0·25	Africa, west coast:—Sheet 18, river Dodo to Bonny river (plan, Middleton river). 2*s.*
793	m = 0·25	Malacca strait:—Butang group to Pulo Berhala. 3*s.* 6*d.*
2920	m = 0·5	Australia, east coast:—Cape Direction to Cape Grenville. 2*s.* 6*d.*
2513	m = 9·0	New Zealand, east coast of North Island:—Napier port and harbour. 1*s.* 6*d.*
1829	d = 2·62	Pacific ocean:—Fiji islands to Samoa islands. 2*s.* 6*d.*
2260		Ports on the south coast of Norway:—New plan, Christiansand and Songvaar fiords.
2328		Christiansand to Sandö:—New plan, Approaches to Grimstad and Lillesand.
198		Policastro to Cape Sta. Maria di Leuca:—New plan, Port Cotrone.
647		Coronel, Lota, and Colcura bays:—Plan added, Lota bay.
2528		Poverty bay to Cape Palliser:—Plan added, Long point anchorage.
1414		Anchorages in the Solomon islands:—Plans added, Sualala cove, Uru island anchorage, Mappo harbour, Matumba bay, Mandoliana island anchorage, Anchorages on west coast of Savo.

(*J. D. Potter, agent.*)

Charts Cancelled.

No.		Cancelled by	No.
2040	The Solent, Hurst point to Cowes and Southampton water.	New Chart. The Solent, including the Needles channel	2040
2260	Plans of Longvaar Fiord and Christiansand Fiord on this sheet.	New Plan. Christiansand and Longvaar Fiords on same sheet	2260
2328	Plan of approach to Grimstad on this sheet.	New Plan. Approaches to Grimstad and Lillesand on same sheet	2328
2305	Plan of approaches to Aalesund on this sheet.	New Chart. Nerlandsö to Lepsö, including the approaches to Aalesund	1291
300	Anchorages on the west coast of Spitzbergen:—La Recherche bay.	New Chart. Anchorages on the west and north coasts of Spitzbergen	300
2751	Plan of Magdalena bay on this sheet.		
1555	Strait of Samos to gulf of Mandelyah.	New Chart. Strait of Samos to Mandelyah gulf	1546
1546	Gulf of Mandelyah.		
2563	Delaware river, outer sheet 1.	New Chart. Delaware river, outer sheet 1	2563
2346	Plans on the coast of Chile.	New Chart. Plans on the coast of Chile	2346

1863 Sheet 18, Forcados river to Cape Formoso.	New Chart.	
	Sheet 18, River Dodo to Bonny river . .	1863
793A Pulo Penang to Parcelar hill.	New Chart.	
793B	Butang group to Pulo Berhala	793
2920 Cape Direction to Cape Grenville.	New Chart.	
	Cape Direction to Cape Grenville . . .	2920
2513 Ahuriri road and port Napier.	New Chart.	
	Napier port and harbour	2513

Charts that have received Important Corrections.

No. 2010, England, west coast:—Morecambe bay. 1951, England, west coast:—Liverpool bay. 1170A, England, west coast:—Holyhead to Great Ormes head. 1170B, England, west coast:—Great Ormes head to Liverpool. 758, Madagascar, northern portion:—Cape St. Andrew to Antongil bay. 759A, Madagascar:—Cape St. Andrew to Bevato island. 2017, Ireland, south coast:—Dungarvan harbour. 2327, Norway:—The Naze to Christiansand. 2305, Norway:—Stav fiord to Romsdals islands. 2241, Entrance to gulf of Finland. 2279, Gulf of Finland:—St. Petersburg bay. 2245, Gulf of Finland:—Hogland to Seakär, south shore. 1126, Ports and anchorages in Corsica. 204, Italy:—Gallipoli harbour. 2207, Black Sea:—Danube river, mouths of the Kilia branch, etc. 2835, Black Sea:—Delta of the Danube river, and entrance to Lake Razem. 2231, Black Sea:—Kaliakra to Odessa. 2232, Black Sea:—Odessa to Sevastopol. 603, Black Sea:—Cape Fontana to Tendra peninsula. 234, Egypt:—Port Said. 867, Bermuda:—From the Narrows to Hamilton. 360, Bermuda islands. 2876, Newfoundland:—Codroy road to Bear head. 2490, North America, east coast: Pemaquid point to Fletcher's neck. 2890, North America, east coast:—Nantucket shoals to Block island. 612, North America, east coast:—Little Spoon island to Pemaquid point, etc. 98, Cuba:—Approaches to ports Casilda and Masio, with the adjacent anchorages. 2103, Gulf of Mexico:—Laguna de Terminos, western entrance. 2831, Gulf of Mexico:—Galveston bay. 23, South America, west coast:—Channel between Magellan strait and Gulf of Trinidad. 1303, South America, west coast:—Approaches to Lota and Coronel. 561, South America, west coast:—Magellan strait to Gulf of Penas. 2840, Vancouver island:—Haro strait and Middle channel. 1001, Africa, west coast:—St. Louis or Guet-n'dar anchorage and Senegal bar; Goree road and harbour. 2760, Sumatra, west coast:—Acheh head to Tyingkok bay. 855, Anchorages on the west coast of Sumatra. 359, Japan:—Nagasaki to Karatsu, etc. 140, Japan:—Mats'sima to Atsusi-no-O-sima, etc. 836, Japan:—Amakusa islands and Yatsushiro sea. 2657, Japan:—Gulf of Tokyo or Yedo. 2875, Japan:—Seto Uchi or Inland sea. 83, Japan:—Channels between Misima Nada and Iyo Nada. 1757, Pacific ocean:—Nukulau island to Namuka island, etc. 766, Pacific ocean:—Ellice islands, south-eastern group. 2867, Islands and anchorages in the North Pacific.

(*J. D. Potter, Agent.*)

Chilian Charts. **Oficina Hidrográfica de Chile.**

No. 59, Caleta Lobos i Costas Vecinas, Costa de Chile. No. 60, Puerto de Corral, Costa de Chile. Taller de la Oficina Hidrográfica de Chile, 1896. *Presented by the Oficina Hidrográfica de Chile.*

U.S. Charts. **U.S. Hydrographic Office.**

No. 1468, Cleveland Harbor and Approaches. No. 1467, South Chicago. No. 1480, Detroit River, from Detroit River (Bar Point) Lighthouse to Mamajuda Lighthouse. No. 1543, Pelée Passage, Lake Erie. Pilot Chart of the North Atlantic Ocean, July, 1896. U.S. Department of the Navy, Bureau of Navigation, Washington, D.C., 1896. Charles D. Sigsbee, Comm. U.S. Hydrographer. *Presented by the U.S. Hydrographic Office.*

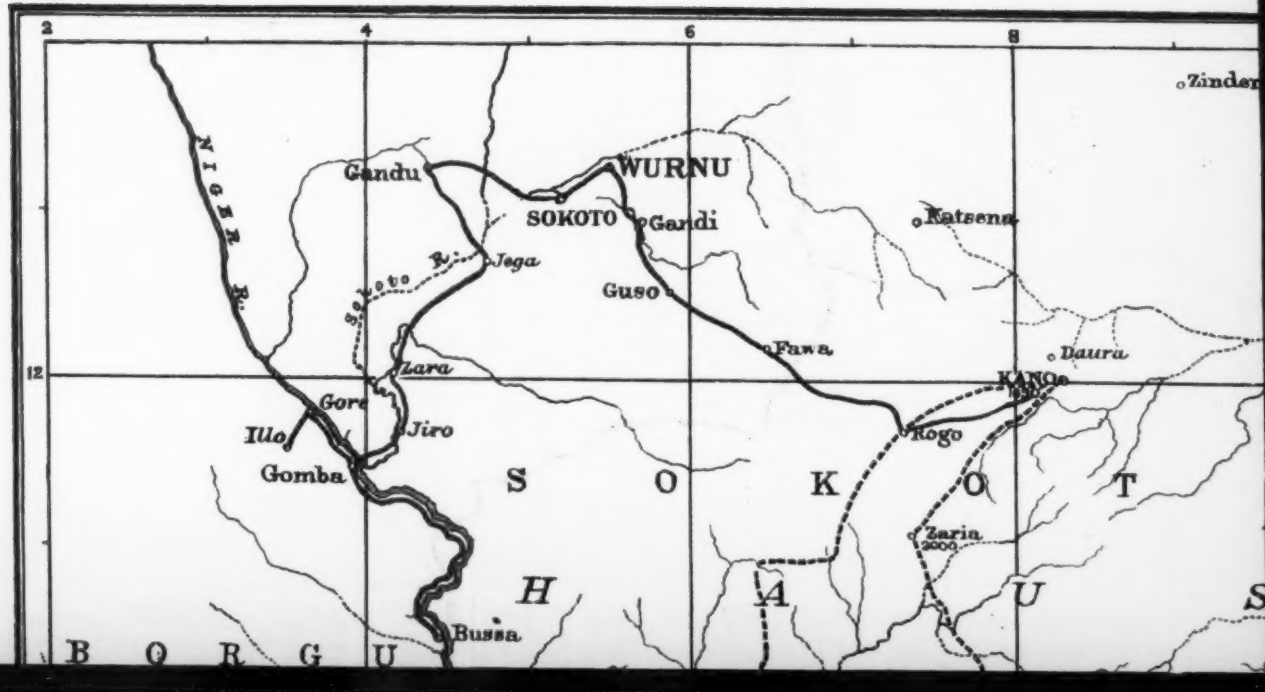
PHOTOGRAPHS.

St. Helena. **Swinton.**

View from the Ridge, St. Helena, 1896. *Presented by Col. A. Swinton.*

This photograph is an addition to the series previously presented by Colonel Swinton, and gives a very good idea of the inland scenery of the island of St. Helena.

N.B.—It would greatly add to the value of the collection of Photographs which has been established in the Map Room, if all the Fellows of the Society who have taken photographs during their travels, would forward copies of them to the Map Curator, by whom they will be acknowledged. Should the donor have purchased the photographs, it will be useful for reference if the name of the photographer and his address are given.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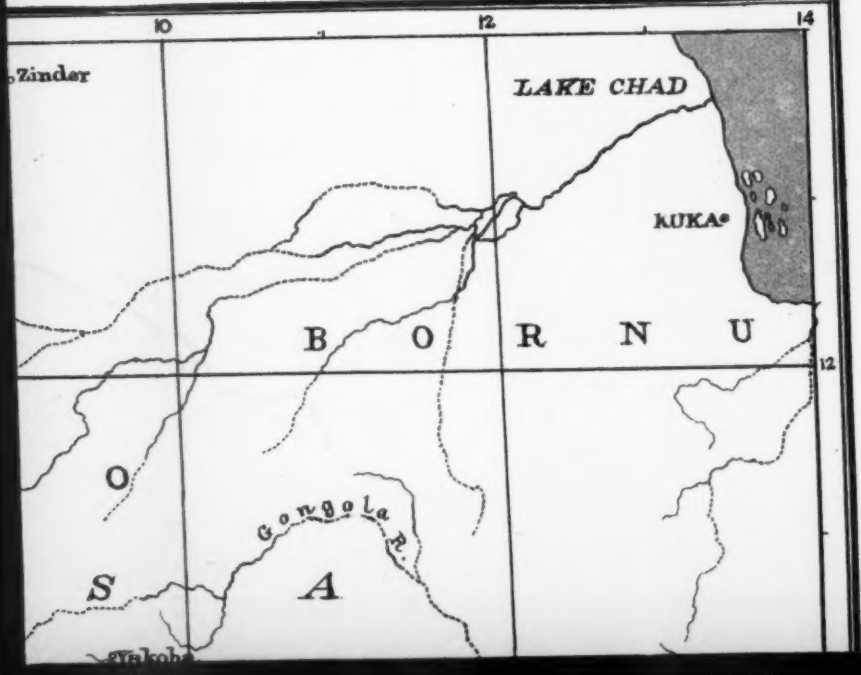
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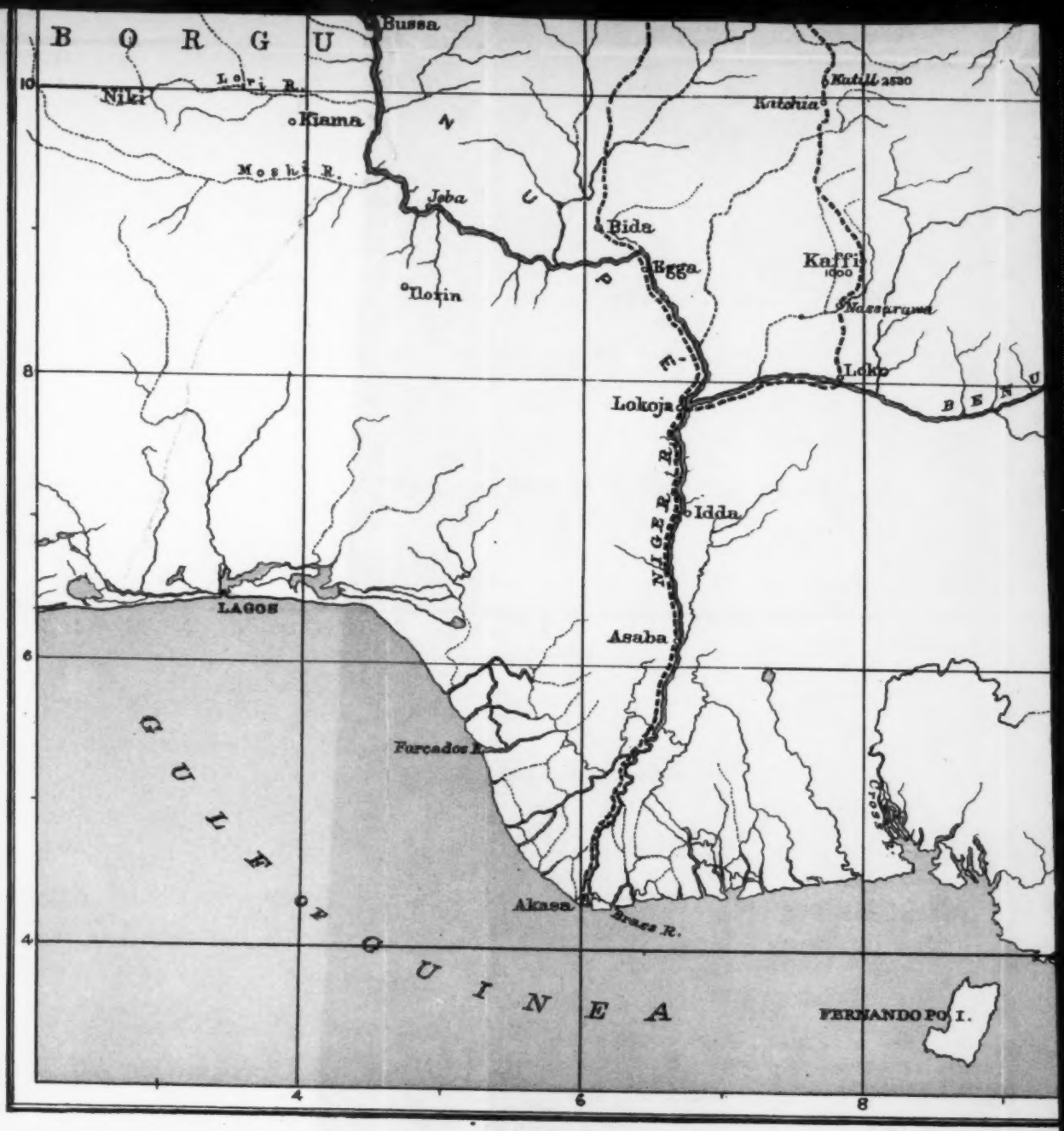
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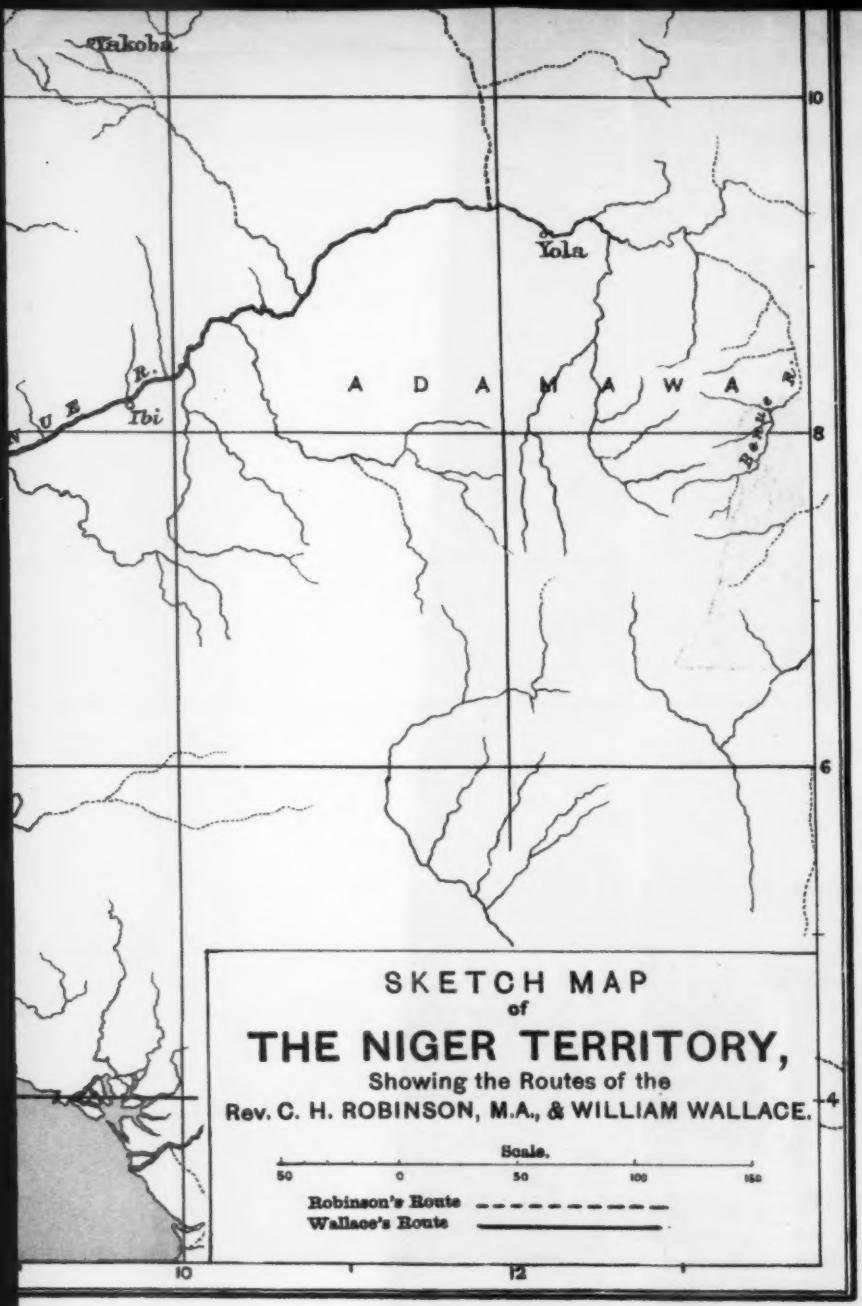

SKETCH MAP
of
THE NIGER TERRITORY,
Showing the Routes of the
Rev. C. H. ROBINSON, M.A., & WILLIAM WALLACE.

Scale.
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Robinson's Route
Wallace's Route